Material Data Safety Sheet

Product Name: Belgian Cocoa - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-COCO-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Café Mocha - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-CAFE-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Captain Jack - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-CAPT-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information: The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: CoolMist - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MIST-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Freedom Juice - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-FRDM-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: HX3 - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-HX3X-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Kringles Curse - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-KRNG-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Longhorn - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-LONG-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Malibu - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MLBU-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Menthol Ice - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MNIC-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Midnight Apple - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MAPL-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Mystic - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MYST-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Prime15 - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-PRME-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Shamrock - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-SHAM-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Tiki Juice - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TIKI-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Torque 56 - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TORQ-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Tribeca - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TRIB-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Truepure - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TRUE-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Turkish Tobacco - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TURK-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Twisted Java - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-JAVA-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Southern Classic - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-SOTH-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: SubZero - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-SUBZ-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Voodoo - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-VODO-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m^3 TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m^3 VLE
	France	0.5 mg/m^3 VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m^3 TWA
	Netherlands	0.5 mg/m^3 MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m^3 VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m^3
Glycerin, USP	*United States (OSHA)*	15 mg/m^3

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability: Stable **Polymerization:** Will Not Occur

Reactivity: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Instability Conditions: Avoid contact with incompatible materials, excess heat and ignition sources.

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.
Clean Air Act:		Does not contain any hazardous air pollutants. Does not contain any Class 1 Ozone depletors. Does not contain any Class 2 Ozone depletors.	
Clean Water Act:		None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.	
OSHA:		Not considered highly hazardous by OSHA.	

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Belgian Cocoa - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-COCO-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Belgian Cocoa - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-COCO-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Belgian Cocoa - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-COCO-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Café Mocha - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-CAFE-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Café Mocha - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-CAFE-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Café Mocha - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-CAFE-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Captain Jack - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-CAPT-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Captain Jack - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-CAPT-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Captain Jack - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-CAPT-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: CoolMist - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MIST-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: CoolMist - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MIST-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: CoolMist - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MIST-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Freedom Juice - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-FRDM-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Freedom Juice - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-FRDM-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Freedom Juice - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-FRDM-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: HX3 - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-HX3X-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: HX3 - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-HX3X-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: HX3 - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-HX3X-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Kringles Curse - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-KRNG-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Kringles Curse - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-KRNG-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Kringles Curse - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-KRNG-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Longhorn - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-LONG-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Longhorn - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-LONG-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Longhorn - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-LONG-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Malibu - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MLBU-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Malibu - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MLBU-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Malibu - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MLBU-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Menthol Ice - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MNIC-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Menthol Ice - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MNIC-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Menthol Ice - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MNIC-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Midnight Apple - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MAPL-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Midnight Apple - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MAPL-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Midnight Apple - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MAPL-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Mystic - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MYST-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Mystic - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MYST-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Mystic - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MYST-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information: The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Prime15 - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-PRME-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Prime15 - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-PRME-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Prime15 - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-PRME-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Shamrock - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-SHAM-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Shamrock - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-SHAM-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Shamrock - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-SHAM-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Tiki Juice - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TIKI-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Tiki Juice - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TIKI-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Tiki Juice - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TIKI-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Torque 56 - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TORQ-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Torque 56 - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TORQ-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Torque 56 - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TORQ-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Tribeca - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TRIB-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Tribeca - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TRIB-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Tribeca - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TRIB-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Truepure - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TRUE-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Truepure - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TRUE-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Truepure - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TRUE-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Turkish Tobacco - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TURK-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Turkish Tobacco - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TURK-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Turkish Tobacco - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TURK-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Twisted Java - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-JAVA-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Twisted Java - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-JAVA-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Twisted Java - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-JAVA-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Southern Classic - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-SOTH-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Southern Classic - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-SOTH-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Southern Classic - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-SOTH-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: SubZero - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-SUBZ-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: SubZero - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-SUBZ-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: SubZero - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-SUBZ-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Voodoo - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-VODO-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Voodoo - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-VODO-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Voodoo - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-VODO-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic	
		Dangerous Substance On Label:	Nicotine		
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.	
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.	
			S36/37	Wear protective clothing and gloves.	
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.	
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.	
			S27	Take off all contaminated clothing immediately.	

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Belgian Cocoa - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-COCO-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Café Mocha - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-CAFE-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information: The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Captain Jack - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-CAPT-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: CoolMist - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MIST-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information: The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Freedom Juice - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-FRDM-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: HX3 - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-HX3X-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Kringles Curse - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-KRNG-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information: The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Longhorn - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-LONG-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Malibu - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MLBU-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Menthol Ice - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MNIC-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Midnight Apple - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MAPL-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Mystic - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MYST-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Prime15 - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-PRME-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Shamrock - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-SHAM-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Tiki Juice - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TIKI-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Torque 56 - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TORQ-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Tribeca - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TRIB-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Truepure - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TRUE-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Turkish Tobacco - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-TURK-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Twisted Java - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-JAVA-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information: The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Souther Classic - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-SOTH-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information: The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: SubZero - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-SUBZ-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Voodoo - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-VODO-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Menthol X - 00 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MENX-00MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin. Mixture is prepared under GMP conditions.

Ingredient	Chemical Name	Formula	CAS#	Amount
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 55% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 45% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media: Use water spray, carbon dioxide, dry chemical powder or foam.

Unsuitable Extinguishing Media: Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.

	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.

Specific Use Refill liquid for use in electronic cigarettes.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection: (Large Spills) Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**Propylene Glycol, USP**	*United States (AIHA)*	10 mg/m^3
	Glycerin, USP	*United States (OSHA)*	15 mg/m^3
		Netherlands	0.07 ppm MAC
		Spain	0.5 mg/m^3 VLA-ED

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm^3
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg
	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	
	Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.	

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal: Avoid release to environment. Do not wash away into sewer.

Chemical Properties: Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

DOT Non-Bulk
Not Regulated

DOT Bulk
Not Regulated

IMDG
Not Regulated

ICAO/IATA
Not Regulated

Section 15: Regulatory Information

US FEDERAL

Clean Air Act:
Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
Not considered highly hazardous by OSHA.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Menthol X - 06 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MENX-06MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 06 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.

Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 5939 mg/kg

Dermal Toxicity

0.54%	+	58.85%	+	30.61%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 9622 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*5939 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*9622 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*Xn*	Harmful
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R21*	Harmful in contact with skin.
		Safety Phrases: (Mandatory)	*S2*	Keep out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S46	If swallowed, seek medical advice and show the packaging or label.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Menthol X - 12 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MENX-12MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 12 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 3622 mg/kg

Dermal Toxicity

1.08%	+	58.5%	+	30.43%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 7035 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*3622 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*7035 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.
			S27	Take off all contaminated clothing immediately.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Menthol X - 18 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MENX-18MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 18 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2620 mg/kg

Dermal Toxicity

1.61%	+	58.15%	+	30.24%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 5566 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2620 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*5566 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.
			S27	Take off all contaminated clothing immediately.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

Disclaimer: The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Date Issued: 12/16/2013

Material Data Safety Sheet

Product Name: Menthol X - 24 mg/ml

Section 1: Product and Company Identification

Product ID: ELIQ-MENX-24MG

Synonyms: E-liquid, E-Juice, Essence

CAS#: Mixture

RTEC: Not Available

CI#: Not Available

Contact Information:

The Halo Company
PO Box 406
Pompton Plains, NJ 07444
United States Of America
Phone: (1) 888-425-6649 x701

Section 2: Composition Information

Description: This mixture contains USP Grade Propylene Glycol, USP Grade Glycerin and USP Grade Nicotine. Mixture is prepared under GMP conditions, and nicotine concentration is verified by HPLC and NMR.

Ingredient	Chemical Name	Formula	CAS#	Amount
L-Nicotine, USP	(−)-1-Methyl-2-(3-pyridyl) pyrrolidine	$C_{10}H_{14}N_2$	54-11-5	= 24 mg/ml
Propylene Glycol, USP	1,2-propanediol	$C_3H_8O_2$	57-55-6	< 40% by weight
Glycerin, USP	1,2,3-propanetriol	$C_3H_8O_3$	56-81-5	< 30% by weight
Proprietary Flavor Blend:	N/A	N/A	N/A	< 15% by weight

Section 3: Hazards Identification

Eye Contact: May cause eye irritation.

Skin Contact: May be toxic in contact with skin. May cause skin irritation.

Inhalation: May be irritating to mucous membranes and upper respiratory tract.

Ingestion: May cause nausea, abdominal pain, or sweating. May be toxic or fatal if swallowed.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Serious Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5: Fire and Explosion Data

General Information:

L-Nicotine, USP:	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	244 °C
	Flash Points:	Closed Cup: 101 °C
	Flammable Limits :	Lower: 0.7% / Upper: 4 %
	Products of Combustion:	Carbon Oxides (CO, CO2), Nitrogen Oxides (NO, NO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks.
Propylene Glycol, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	371 °C
	Flash Points:	Closed Cup: 99 °C / Open Cup: 107 °C
	Flammable Limits :	Lower: 2.6% / Upper: 12.5%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in presence of heat.
Glycerin, USP	*Flammability:*	May be combustible at high temperature.
	Auto-Ignition Temp.:	370 °C
	Flash Points:	Closed Cup: 160 °C / Open Cup: 199 °C
	Flammable Limits :	Lower: 0.9%
	Products of Combustion:	Carbon Oxides (CO, CO2)
	Explosive Hazards:	Not Available
	Fire Hazards:	Slightly flammable to flammable in in presence of heat, open flames, and sparks. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions

Suitable Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or foam.
Unsuitable Extinguishing Media:	Do not use extinguishing media containing oxidizing agents.

Section 6: Accidental Release Measures

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill:	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Handing Precautions	*Safe Handling:*	Do not allow getting into eyes, on skin and on clothing. Avoid prolonged or repeated exposure.
	Environment:	Avoid runoff into storm sewers and ditches which lead to waterways.
	Incompatibility:	Keep away from oxidizing agents and strong acids.
Storage Precautions	*Temperature:*	Store between 50°F - 70°F. Keep away from high heat.
	Sunlight:	Store protected from sunlight and artificial light.
	Humidity:	Store in a cool dry place protected from moisture.
	Ventilation:	Provide adequate ventilation. Keep away from fumes.
	Packaging:	Store in tightly closed containers. Do not reuse containers.
Risk Management	*Corrosive Conditions:*	Non corrosive in presence of glass.
	Flammability Hazards:	Emits toxic fumes under fire conditions.
	Evaporative Conditions:	Keep surrounding cool and well ventilated.
	Ignition Sources:	Keep away from potential sources of ignition.
Specific Use	Refill liquid for use in electronic cigarettes.	

Section 8: Exposure Controls and Personal Protection

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection: (Large Spills)	Splash goggles, full suit, vapor respirator, boots and gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:	**L-Nicotine, USP:**	*United States (OSHA)*	0.5 mg/m^3 TWA

	United Kingdom	0.5 mg/m³ TWA
	United Kingdom	1.5 ppm STEL
	Belgium	0.5 mg/m³ VLE
	France	0.5 mg/m³ VME
	Germany	0.47 mg/m3 TWA
	Germany	0.07 ppm TWA
	Malaysia	0.5 mg/m³ TWA
	Netherlands	0.5 mg/m³ MAC
	Netherlands	0.07 ppm MAC
	Spain	0.5 mg/m³ VLA-ED
Propylene Glycol, USP	*United States (AIHA)*	10 mg/m³
Glycerin, USP	*United States (OSHA)*	15 mg/m³

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Vapor Pressure:**	Not Available
Color	Clear to Light Yellow	**Density:**	1,125 g/cm³
Odor:	Slightly Pungent	**Rel. Density:**	Not Available
pH-value:	Not available	**Vapor Density:**	>1 vs aih
Boiling point:	250°C	**Evaporation Rate:**	Not Available
Freezing Point:	-65° C	**Water Solubility:**	50 mg/ml
Viscosity: (Dynamic at 20°C)	600 mPas		

Section 10: Stability and Reactivity

Chemical Stability:	Stable	**Polymerization:**	Will Not Occur
Reactivity:	Reactive with oxidizing agents, reducing agents, acids, alkalis.		
Instability Conditions:	Avoid contact with incompatible materials, excess heat and ignition sources.		

Section 11: Toxicology Information

L-Nicotine, USP:	*Oral, Rat:*	LD50	= 50 mg/kg
	Dermal, Rat:	LD50	= 140 mg/kg
	Dermal, Rabbit:	LD50	= 50 mg/kg
Propylene Glycol, USP	*Oral, Rat:*	LD50	= 20,000 mg/kg
	Oral, Mouse:	LD50	= 22,000 mg/kg

	Dermal, Rabbit:	LD50	= 20,800 mg/kg
Glycerin, USP	*Oral, Rat:*	LD50	= 12,600 mg/kg
	Oral, Mouse	LD50	= 4,090 mg/kg
	Dermal, Rabbit:	LD50	= 10,000 mg/kg
	Mist, Rat	LC50	= 570 mg/m^3 / 1 hour (Based on 4-hour exposure)

Section 12: Ecological Information

L-Nicotine, USP:	*Toxicity:*	Fish (fresh water)	Toxic: 3-29ppm
		Fish (Onchorhynchus mykiss)	96hr: LC50 = 4mg/l
		Daphnia (Daphnia magna)	48hr: LC50 = 0.24mg/l
	Degradability:	*Products of Biodegradation:* Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.	
		Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.	
	Accumulation:	*Bioaccumulation Estimates from Log Kow (BCFWIN v2.17):* Log BCF from regression-based method = 0.201 (BCF = 1.588) log Kow used: 1.17 (expkow database)	
	Mobility in Soil:	*Soil Adsorption Coefficient (PCKOCWIN v1.66):* Koc: 2376 Log Koc: 3.376	
Propylene Glycol, USP	*Toxicity:*	Fish (Oncorhynchus mykiss)	96 h: LC50 = 40,613 mg/l
		Water Flea (Ceriodaphnia Dubia)	48 h: LC50 = 18,340 mg/l
	Degradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).	
	Accumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3) Log Pow used: -1.07 EU Method A.8 (Partition Coefficient) Bioconcentration Factor (BCF): 0.09; Estimated.	
	Mobility in Soil:	Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50). Koc: < 1 (estimated) Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured	
Glycerin, USP	*Toxicity:*	No aquatic environmental information is available on this product.	
	Degradability:	This product is completely biodegradable.	
	Accumulation:	Bioaccumulation of this product has not been determined.	

Mobility in Soil:	Mobility of this material has not been determined. Low potential for sorption to soil. Glycerine will partition primarily to water.

Section 13: Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER.

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused and uncontaminated product, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

Sewage Disposal:	Avoid release to environment. Do not wash away into sewer.
Chemical Properties:	Substance is hygroscopic and should not be allowed to come in contact with moisture/water.

Section 14: Transport Information

US FEDERAL

Reference: 49 CFR § 173.132(a)
Reference: 49 CFR § 173.132(b)(1)
Reference: 49 CFR § 173.132(b)(2):
Based on 49 CFR, the LD50 (oral and dermal) should be calculated based on the testing of animals in the absence of adequate data on human toxicity.
Reference: 49 CFR § 173.132(c):
The LD50 (oral and dermal) of a mixture is determined by the following formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

C = the % concentration of constituent A, B ... Z in the mixture;
T = the oral LD50 values of constituent A, B ... Z;
TM = Oral/Dermal LD50 value of the mixture.

Based on the formula above, the LD50 of the Total Mixture (T_M) is for this product is calculated as:

Oral Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
50		20000		12600		15000		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Oral LD50 of Mixture (T_M) = 2060 mg/kg

Dermal Toxicity

2.13%	+	57.81%	+	30.06%	+	10%	=	100%
140		20800		10000		15500		T_M
Nicotine		Propylene Glycol		Glycerin		Flavoring		Mixture

Dermal LD50 of Mixture (T_M) = 4620 mg/kg

Reference: 49 CFR § 173.132(a)(1)(i)
Reference: 49 CFR § 173.132(a)(1)(ii)
Reference: 49 CFR § 173.133(a)(1):
Under CFR Title 49, this mixture is not presumed to be toxic to humans based on the following:

Oral LD50 of Mixture	*2060 mg/kg*	>	300 mg/kg
Dermal LD50 of Mixture	*4620 mg/kg*	>	1000 mg/kg

Section 15: Regulatory Information

US FEDERAL

TSCA	*Nicotine 54-11-5*	**Inventory:**	Listed on the TSCA inventory
		Health & Safety Reporting List	Not listed on the Health & Safety Reporting List.
		Chemical Test Rule	Not under a Chemical Test Rule.
		Section 12b	Not listed under TSCA Section 12b.
		SNUR	Does not have a Significant New Use Rule under TSCA.
SARA	*Nicotine 54-11-5*	**Section 302: (RQ)**	CAS# 54-11-5: final RQ = 100 pounds (45.4 kg)
		Section 302: (TPQ)	CAS# 54-11-5: TPQ = 100 pounds; RQ = 100 pounds
		Section 313:	This material contains Nicotine (CAS# 54-11-5, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and CFR Part 373.
		SARA Codes:	CAS # 54-11-5: acute, chronic.

Clean Air Act:

Does not contain any hazardous air pollutants.
Does not contain any Class 1 Ozone depletors.
Does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Not considered highly hazardous by OSHA.

EUROPEAN / INTERNATIONAL

The product has been classified as dangerous according to Directive 67/548/EEC, 1999/45/EC and Regulation (EC) No. 1272/2008.

Labeling: EC Directives	*Nicotine 54-11-5*	**Hazard Symbols:**	*T*	Toxic
		Dangerous Substance On Label:	Nicotine	
		Hazard Phrases: (Mandatory)	*R24*	Toxic in contact with skin.
		Safety Phrases: (Mandatory)	*S1/2*	Keep locked up and out of reach of children.
			S36/37	Wear protective clothing and gloves.
			S45	In case of accident or if you feel unwell, seek medical advice immediately and show this label where possible.
		Safety Phrases: (Optional)	*S13*	Keep away from food, drink and animal feeding stuffs.
			S27	Take off all contaminated clothing immediately.

Section 16: Other Information

Acronyms:

EC:	European Commission
CLP:	Classification Labelling and Packaging
GHS:	Globally harmonized system on classification and labelling
DSD:	Dangerous Substance directive
EWC:	*European* Waste Catalogue
AVV:	Waste codes according to the waste catalogue ordinance
ADR:	European agreement concerning the International Carriage of Dangerous Goods by Road
RID:	European agreement concerning the International Carriage of Dangerous Goods by Rail
LC50:	Lethal concentration, 50 percent
LD50:	Lethal dose, 50 percent

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Date Issued: 12/16/2013