

Spill Contingency Plan Appendix 6-A

Safety Data Sheets



Section 01 Identification

Product Identifier	Sodium Hypochlorite 12-16%
	Sodium Hypochlorite 12%, NSF® - 60
	Sodium Hypochlorite 12.5% With 1% Alkalinity
	Sodium Hypochlorite 13%, NSF® - 60
	Sodium Hypochlorite 15%, NSF® - 60
	Sodium Hypochlorite 16%, NSF® - 60
Other Means of Identification	Sodium hypochlorite, Bleach, Chlorox, Hypochlorous acid, sodium salt, Javel water, liquid bleach.
Product Use and Restrictions on Use	Bleaching agent, source of available chlorine, deodorizer.
Initial Supplier Identifier	ClearTech Industries Inc
	1500 Quebec Avenue
	Saskaloon, SK. Canada S7K 1V7
	Phone: 800.387.7503
	Fax: 888.281.8109
Prepared By	ClearTech Industries Inc. technical writer
24-Hour Emergency Phone	306.664.2522

Section 02 Hazard Identification

Physical Hazards	
Corrosive to metals	Category 1
Health Hazards	
Skin corrosion / irritation	Category 1B
Serious eye damage / eye irritation	Category 1
Signal Word	

Danger

Hazard Statements

- H290 May be corrosive to metals.
- H314 Causes severe skin burns and eye damage.

Pictograms



P234 Keen only in original packaging

Precautionary Statements

Prevention

1 204	Reep only in orginal packaging.
P260	Do not breathe vapours, fumes, and mists.
P264	Wash affected body parts thoroughly after handling.
P280	Wear protective gloves, protective clothing, eye protection, face protection
Response	
P301 P330 P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 P361 P353 P363	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse.
P304 P340 P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor.
P305 P351 P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P390	Absorb spillage to prevent material damage.
Storage	
P405	Store locked up.
Disposal	
P501	Dispose of contents / container in accordance with all federal, provincial and / or local regulations including the Canadian Environmental Protection Act.

Hazards Not Otherwise Classified

Contact with acids liberates toxic gas.

Supplemental Information

Not available

Section 03 Composition / Information on Ingredients

Hazardous Ingredients:

Chemical name	Common name(s)	CAS number	Concentration (w/w%)
Hypochlorous acid, sodium salt	Sodium hypochlorite	7681-52-9	10-16%

Section 04 First-Aid Measures

Description of necessary first-aid measures

- Inhalation Remove source of exposure or move person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor. If breathing has stopped, trained personnel should begin rescue breathing or if the heart has stopped, immediately start cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED). Avoid mouth to mouth contact by using a barrier device. May release toxic chlorine gas.
- **Ingestion** Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor. If vomiting occurs naturally, lie on your side, in the recovery position.
- SkinAvoid direct contact. Wear chemical protective clothing, if necessary. Take off immediately contaminated
clothing, shoes and leather goods. Rinse skin with lukewarm, gently flowing water / shower for 30 minutes.
Immediately call a POISON CENTER or doctor. Wash contaminated clothing before re-use, or discard.

Eye Avoid direct contact. Wear chemical protective gloves, if necessary. Remove source of exposure or move person to fresh air. Rinse eyes cautiously with lukewarm, gently flowing water for several minutes, while holding the eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing for 30 minutes. Take care not to rinse contaminated water into the unaffected eye or onto the face. Immediately call a POISON CENTER or doctor.

Most important symptoms and effects, both acute and delayed

Inhalation	Causes severe burns to the mouth and throat (mist). May release toxic and irritating chlorine gas.
Ingestion	Causes burns to the mouth and throat.
Skin contact	Causes severe skin burns.
Eye contact	Causes serious eye damage.
Further information	For further information see Section 11 Toxicological Information.

Section 05 Fire Fighting Measures

Suitable extinguishing media	Extinguish fire using extinguishing agents suitable for the surrounding fire.
Unsuitable extinguishing media	Do NOT use dry chemical fire extinguishing agents containing ammonium compounds (such as some A:B:C agents), since an explosive compound can be formed. Water jets are not recommended in fires involving chemicals.
Specific hazards arising from the chemical	Explosive decomposition may occur under fire conditions and closed containers may rupture violently due to a rapid decomposition, if exposed to fire or excessive heat for a sufficient period of time.
Special protective equipment for fire-fighters	Wear NIOSH-approved self-contained breathing apparatus and chemical-protective clothing.

Section 06 Accidental Release Measures

Personal Precautions / Protective Equipment / Emergency Procedures	Wear appropriate personal protective equipment (See Section 08 Exposure Controls and Personal Protection). Stay upwind, ventilate area. Do not breathe vapours, fumes, and mists. Do not use material handling equipment with exposed metal surfaces. Sodium hypochlorite solutions release chlorine when in contact with acids or oxidizable materials, such as oganic material or most metals. Chlorine is a respiratory irritant, so respiratory protection is advised.
Environmental Precautions	Prevent material from entering waterways, sewers or confined spaces. Notify local health and wildlife officials. Notify operators of nearby water intakes.
Methods and Materials for Containment and Cleaning Up	SMALL SPILLS: Stop or reduce leak if safe to do so. Clean up spill with non-reactive absorbent and place in suitable, covered, labeled containers. Flush area with water. Contaminated absorbent material may pose the same hazards as the spilled product. Use vented containers to avoid pressure buildup. LARGE SPILLS: Contact fire and emergency services and supplier for advice.

Section 07 Handling and Storage

 Precautions for Safe Handling
 Use proper equipment for lifting and transporting all containers. Use sensible industrial hygiene and housekeeping practices. Wash thoroughly after handling. Avoid all situations that could lead to harmful exposure. Prevent the release of vapours, fumes, and mists into the workplace air.

 Inspect containers for damage or leaks before handling. If the original label is damaged or missing replace with a workplace label. Have suitable emergency equipment for fires, spills and leaks readily available.

Never return contaminated material to its original container.

Conditions for Safe Storage	Store in a cool, dry, well-ventilated area, out of direct sunlight, away from heat sources and incompatible materials. Always store in original labeled container. Keep containers tightly closed when not in use and when empty. Empty containers may contain hazardous residues. Protect label and keep it visible. Do not transfer to metal containers. Strong solutions (greater than 10% available chlorine) may slowly give off chlorine during storage, especially when warm (above 18°C). Vent caps are required to prevent a build-up of pressure that could cause containers to burst.
Incompatibilities	Acids, such as sulphuric, nitric, hydrochloric, phosphoric, flurosilicic (HFSA), sulphonic, acetic, citric, oxalic, and formic. Oxidizing agents, such as oxygen, hydrogen peroxide, sulphuric and nitric acids and permanganates.
	Reducing agents, such as hydrogen, sodium borohydride, sulphur dioxide, thiosulphates, hydrazine, phosphites, carbon, and oxalic, formic and ascorbic acid. Organic material, such as wood, paper, gasoline, diesel, solvents and some glycol based heat transfer fluids
	Metals, such as aluminum, steel, and brass.

Section 08 Exposure Controls and Personal Protection

Exposure limits

Component	Regulation	Type of listing	Value
Sodium Hypochlorite	NIOSH	REL	2 mg/m³
	OSHA	PEL	2 mg/m³
Chlorine	ACGIH	TWA	0.1 ppm

Engineering controls

Ventilation Requirements	Mechanical ventilation (dilution or local exhaust), process or personnel enclosure and control of process conditions should be provided in accordance with all fire codes and regulatory requirements. Supply sufficient replacement air to make up for air removed by exhaust systems.
Other	An emergency shower and eyewash station should be available, tested, and be in close

Protective equipment

The following are recommendations only. It is the responsibility of the employer / user to conduct a hazard assessment of the process in which this product being used and determine the proper engineering controls and PPE for their process. Additional regulatory and safety information should be sought from local authorities and, if needed, a professional industrial hygienist.

proximity to the product being handled in accordance with provincial regulations.

Eye and face protection	Where there is potential eye or face exposure, tightly fitting safety goggles and a face shield or a full face respirator or similar protective equipment which protects the wearer's face and eyes are recommended. Contact lenses are not recommended; they may contribute to severe eye injury.
Hand and body protection	Disposable latex or nitrile gloves are recommended to prevent incidental contact. Butyl rubber, neoprene, or PVC skin protection is recommended for extended contact. Leather gloves are not recommended for chemical protection. Refer to manufacturer's specifications for breakthrough times and permeability information; note that breakthrough times and permeability vary with temperature, application and age of material. Continued use of contaminated safety gear or clothing is not recommended; wash before reuse or discard.
Respiratory protection	In case of insufficient ventilation wear suitable respiratory equipment.

NIOSH respirator recommendations for: Chlorine

Up to: 5 ppm

(APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against Chlorine

(APF = 10) Any supplied-air respirator

Up to: 10 ppm

(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against Chlorine
(APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against Chlorine
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against Chlorine
(APF = 50) Any self-contained breathing apparatus with a full facepiece.

(APF = 50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against Chlorine Any appropriate escape-type, self-contained breathing apparatus Not available

Section 09 Physical and Chemical Properties

Appearance

Thermal hazards

Physical state	Liquid
Colour	Clear, greenish-yellow solution
Odour	Strong chlorine odour
Odour threshold	Not available
Property	
рН	10.8-11.2
Melting point / freezing point	Not available
Initial boiling point and boiling range	Not available
Flash point	Not available
Evaporation rate	Not available
Flammability	Not applicable
Upper flammable limit	Not available
Lower flammable limit	Not available

Vapour pressure	Negligible
Vapour density	Not available
Relative density	Not applicable
Solubility	Completely soluble in water
Partition coefficient: n- octanol/water	Log POW = ~ -3.42
Auto-ignition temperature	Not available
Decomposition temperature	Sodium hypochlorite's decomposition rate is an exponential function of temperature. Each increase of 10 °C will increase the degredation rate by a factor of 2 to 4 (there is disagreement in the literature).
Viscosity	Not available
Specific gravity	1.1-1.2 g/mL
Formula	NaOCI
Molecular weight	74.44 g/mol

Section 10 Stability and Reactivity

Reactivity	May be corrosive to metals. Reacts violently with acids.
Stability	Sodium hypochlorite solutions are unstable and will decompose over time. Sodium hypochlorite's decomposition rate is an exponential function of temperature. Each increase of 10 °C will increase the degredation rate by a factor of 2 to 4 (there is disagreement in the literature). Exposure to ultraviolet light (sunlight) will accelerate the degredation of sodium hypochlorite.
Possibility of hazardous reactions	Hazardous polymerization is not known to occur. Reacts with acids to form hypochlorous acid, a powerful oxidizing agent, which degrades into toxic chlorine gas.
Conditions to avoid	Avoid contact with incompatible materials. Do not heat. Do not freeze.
Incompatible materials	Acids, such as sulphuric, nitric, hydrochloric, phosphoric, flurosilicic (HFSA), sulphonic, acetic, citric, oxalic, and formic.
	Oxidizing agents, such as oxygen, hydrogen peroxide, sulphuric and nitric acids and permanganates.
	Reducing agents, such as hydrogen, sodium borohydride, sulphur dioxide, thiosulphates, hydrazine, phosphites, carbon, and oxalic, formic and ascorbic acid.
	Organic material, such as wood, paper, gasoline, diesel, solvents and some glycol based heat transfer fluids
	Metals, such as aluminum, steel, and brass.
Hazardous decomposition products	Chlorine, sodium chlorate.

Section 11 Toxicological Information

Acute Toxicity (LD50 / LC50 values)

Component	Route	Species	Value	Exposure time
Sodium Hypochlorite	Oral	Rat	>5,000 mg/kg bw	
Chlorine	Inhalation	Mouse	137 ppm	1 hour

Toxic Health Effect Summary

Chemical
characteristicsToxicity caused primarily by high pH and oxidative potential. Hypochlorites may react with organic
molecules to form organochlorides which have unknown toxicology.

Skin	Very dilute solutions have caused negligible irritation, while more concentrated solutions have caused acute corrosive injury to skin. Prolonged exposure may lead to permanent scarring of skin.
Ingestion	Acute exposure may lead to burning of the mouth and throat, abdominal cramps, nausea, vomiting, diarrhea, shock. May lead to convulsions, coma, and even death.
Inhalation	Causes severe burns to the mouth and throat (mist). May release toxic and irritating chlorine gas. Chlorine, one of the primary decomposition products of sodium hypochlorite, is an irritant of the nose and throat, causing coughing, difficulty breathing, and pulmonary edema.
Eye contact	Causes irritation, redness, and pain. May cause burns and possible damage to vision.
Sensitization	This product and its components at their listed concentration have no known sensitizing effects.
Mutagenicity	This product and its components at their listed concentration have no known mutagenic effects.
Carcinogenicity	IARC has classified hypochlorite salts as group 3, not classifiable as to its carcinogenicity to humans.
Reproductive toxicity	This product and its components at their listed concentration have no known reproductive effects.
Specific organ toxicity	This product and its components at their listed concentration have no known effects on specific organs.
Aspiration hazard	Prolonged or repeated overexposure may cause lung damage.
Synergistic materials	Not available

Section 12 Ecological Information

Ecotoxicity

Component	Туре	Species	Value	Exposure Time
Sodium Hypochlorite	EC50	Red algea	46 mg/L	96 hours
	LC50	Salmo gairdneri	0.07 mg/L	48 hours
	LC50	Daphnia magna	0.032 mg/L	48 hours
Biodegradability	The domestic substance list categorizes sodium hypochlorite as non-persistent.			
Bioaccumulation	The domestic substance list categorizes sodium hypochlorite as non-bioaccumulative.			
Mobility	This product is water soluble, is not predicted to adsorb to soil and may contaminate ground water.			
Other adverse effects	The domestic substa organisms.	ance list categorizes sodi	um hypochlorite as	inherently toxic to aquatic

Section 13 Disposal Considerations

Waste From Residues / Unused Products	Dispose in accordance with all federal, provincial, and local regulations including the Canadian Environmental Protection Act.
Contaminated Packaging	Do not remove label, follow label warnings even after the container is empty. Empty containers should be recycled or disposed of at an approved waste handling facility.

Section 14 Transport Information

UN number	UN 1791
UN proper shipping name and description	HYPOCHLORITE SOLUTION with more than 7% available chlorine
Transport hazard class(es)	8
Packing group	III

Excepted quantities	5 L		
Environmental hazards	Listed as a marine pollutant u	Inder Canadian TDG Regulati	ons, schedule III.
Special precautions	No special provisions		
Transport in bulk	ERAP index: not required		
	MARPOL 73/78 and IBC Cod	de:	
	Product name:	Sodium hypochlorite solution	(15% or less)
	Pollution category: Y		
	Hazards:	the product is included in the and pollution hazards.	Code because of both its safety
	Ship type:	ship type 2	
	Tank type:	integral gravity tank	
	Tank vents:	controlled venting	
	Tank environmental control:	no special requirements unde	er this Code
		Temperature classes	no requirements
	Electrical equipment:	Apparatus group	no requirements
		Flash point	non-flammable product
	Gauging:	restricted gauging	
	Vapour detection:	no special requirements unde	er this Code
	Fire protection:	no special requirements unde	er this Code
	Emergency equipment	no special requirements unde	er this Code
	Specific and operational requirements	15.19.6	
Additional information	Secure containers (full or em are secured in the closed pos	pty) during shipment and ensuition.	ire all caps, valves, or closures

TDG PRODUCT CLASSIFICATION: This product has been classified on the preparation date specified at section 16 of this SDS, for transportation in accordance with the requirements of part 2 of the Transportation of Dangerous Goods Regulations. If applicable, testing and published test data regarding the classification of this product are listed in the references at section 16 of this SDS.

Section 15 Regulatory Information.

NOTE: THE PRODUCT LISTED ON THIS SAFETY DATA SHEET HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CANADIAN HAZARDOUS PRODUCTS REGULATIONS. THIS SAFETY DATA SHEET CONTAINS ALL INFORMATION REQUIRED BY THOSE REGULATIONS.

All components of this product appear on the domestic substance list.

NSF Certification: Hypochlor 12 is certified under NSF / ANSI Standard 60 for disinfection & oxidation at a maximum dosage of: 103 mg/L. NSF product use restrictions based on requirements obtained from the NSF website; consult NSF website for current requirements.

Section 16 Other Information

Date of latest revision: June 11, 2020

Note: The responsibility to provide a safe workplace remains with the buyer / user. The buyer / user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the buyer / user to comply with all applicable laws and regulations regarding handling, using, reselling and shipping this product.

Attention: Receiver of the chemical goods / SDS coordinator

As part of our commitment to the RDC Responsible Distribution® initiative, ClearTech Industries Inc. and its associated companies require, as a condition of sale, that you forward the attached Safety Data Sheet(s) to all affected employees, customers, and end-users. ClearTech will send any available supplementary handling, health, and safety information to you at your request.

If you have any questions or concerns please call our customer service center.

References:

1) CHEMINFO 2) TOXNET 3) eChemPortal 4) ECHA 5) Transportation of Dangerous Goods Canada 6) HSDB 7) PAN

AFETY DATA SHEET		
URNACE OIL		PETRO-CANADA
00003001241		
ersion 4.0	Revision Date 2018/08/20	Print Date 2022/01/24
ECTION 1. IDENTIFICATION		
Product name	: FURNACE OIL	
Synonyms	: Type 2 Heating Oil, #2 Heating O Oil, #2 Fuel Oil, Seasonal Furna ThermaClean, Farm Diesel, FFC	Dil, #2 Furnace Oil, Heating ce, Seasonal Diesel Fuel,)
Product code	: 102900, 102062, 101875, 10048 101869, 100486, 102061, 10197	34, 100110, 101871, 101870, ′9, 100485, 101868, 101874
Manufacturer or supplier's o	details	
	Petro-Canada P.O. Box 2844, 150 - 6th Avenue Calgary Alberta T2P 3E3 Canada	e South-West
Emergency telephone	Suncor Energy: +1 403-296-300	0;
number	Canutec Transportation: 1-888-2 996-6666:	226-8832 (toll-free) or 613-
	Poison Control Centre: Consult I emergency number(s).	ocal telephone directory for
Recommended use of the	e chemical and restrictions on use	
Recommended use	: Fuel Oils are distillate fuels suita	ble for use in liquid fuel

Recommended use	:	Fuel Oils are distillate fuels suitable for use in liquid fuel burning equipment without preheating.
Prepared by	:	Product Safety: +1 905-804-4752

SECTION 2. HAZARDS IDENTIFICATION

Emergency	Overview
-----------	----------

Appearance	Bright oily liquid.
Colour	Clear to slightly yellow or green, undyed liquid. May be dyed red for taxation purposes.
Odour	Mild petroleum oil like.

GHS Classification
Elammable liquide

Petro-Canada is a Suncor Energy business.

Flammable liquids	: Category 3
Acute toxicity (Inhalation)	: Category 4
Skin irritation	: Category 2
Carcinogenicity	: Category 2
Specific target organ toxicity - repeated exposure Internet: www.petro-canada.ca/msds	: Category 2 (Liver, thymus, Bone)

FURNACE OIL

000003001241



Version 4.0	Revision Date 2018/08/20	Print Date 2022/01/24
Aspiration hazard	: Category 1	
GHS label elements		
Hazard pictograms		
Signal word	: Danger	
Hazard statements	 Flammable liquid and vapour. May be fatal if swallowed and en Causes skin irritation. Harmful if inhaled. Suspected of causing cancer. May cause damage to organs (L prolonged or repeated exposure. 	iters airways. iver, thymus, Bone) through
Precautionary statements	 May cause damage to organs (Liver, thymus, Bone) through prolonged or repeated exposure. Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed. Ground and bond container and receiving equipment. Use explosion-proof electrical/ ventilating/ lighting equipment Use non-sparking tools. Take action to prevent static discharges. Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash skin thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/ protective clothing/ eye protection/ faprotection. Response: IF SWALLOWED: Immediately call a POISON CENTER/doc IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF INHALED: Remove person to fresh air and keep comforta for breathing. Call a POISON CENTER/doctor if you feel unw IF exposed or concerned: Get medical advice/ attention. Do NOT induce vomiting. If skin irritation occurs: Get medical advice/ attention. Take off contaminated clothing and wash it before reuse. In case of fire: Use dry sand, dry chemical or alcohol-resistar foam to extinguish. Store in a well-ventilated place. Keep cool. Store locked up. Disposal: Dispose of contents/ container to an approved waste disposal	

FURNACE OIL

000003001241



000003001241		
Version 4.0	Revision Date 2018/08/20	Print Date 2022/01/24
Potential Health Effects		
Primary Routes of Entry	: Eye contact Ingestion Inhalation Skin contact Skin Absorption	
Target Organs	: Skin Eyes Respiratory Tract	
Inhalation	: May cause respiratory tract irritation Inhalation may cause central nerver Symptoms and signs include head muscular weakness, drowsiness a consciousness.	on. ous system effects. lache, dizziness, fatigue, and in extreme cases, loss of
Skin	: Causes skin irritation.	
Eyes	: May cause eye irritation.	
Ingestion	 Ingestion may cause gastrointestir vomiting and diarrhoea. Aspiration hazard if swallowed - ca damage. 	nal irritation, nausea, an enter lungs and cause
Aggravated Medical Condition	: None known.	
Other hazards None known.		
IARC	No component of this product presen equal to 0.1% is identified as probabl human carcinogen by IARC.	at at levels greater than or le, possible or confirmed
ACGIH	No component of this product presen equal to 0.1% is identified as a carcin carcinogen by ACGIH.	at levels greater than or Nogen or potential

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture

: Mixture

Hazardous components

Chemical name	CAS-No.	Concentration
fuels, diesel	68334-30-5	100 %

SECTION 4. FIRST AID MEASURES

FURNACE OIL

000003001241



Version 4.0	Revision Date 2018/08/20	Print Date 2022/01/24
If inhaled	: Move to fresh air. Artificial respiration and/or oxyge Seek medical advice.	en may be necessary.
In case of skin contact	 In case of contact, immediately f for at least 15 minutes while rem and shoes. Wash skin thoroughly with soap skin cleanser. Wash clothing before reuse. Seek medical advice. 	lush skin with plenty of water oving contaminated clothing and water or use recognized
In case of eye contact	 Remove contact lenses. Rinse immediately with plenty of for at least 15 minutes. Obtain medical attention. 	water, also under the eyelids,
If swallowed	: Rinse mouth with water. DO NOT induce vomiting unless physician or poison control cente Never give anything by mouth to Seek medical advice.	directed to do so by a er. an unconscious person.
Most important symptoms and effects, both acute and delayed	: First aider needs to protect hims	elf.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Dry chemical Carbon dioxide (CO2) Water fog. Foam
Unsuitable extinguishing media	:	Do NOT use water jet.
Specific hazards during firefighting	:	Cool closed containers exposed to fire with water spray.
Hazardous combustion products	:	Carbon oxides (CO, CO2), nitrogen oxides (NOx), sulphur oxides (SOx), sulphur compounds (H2S), smoke and irritating vapours as products of incomplete combustion.
Further information	:	Prevent fire extinguishing water from contaminating surface water or the ground water system.
Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, Internet: www.petro-canada.ca/msds Petro-Canada is a Suncor Energy business. : Use personal protective equipment.

FURNACE OIL

000003001241



Version 4.0		Revision Date 2018/08/20	Print Date 2022/01/24
protective equipment and emergency procedures		Ensure adequate ventilation. Evacuate personnel to safe areas. Material can create slippery conditions.	
Environmental precautions	:	If the product contaminates rivers and I respective authorities.	akes or drains inform
Methods and materials for containment and cleaning up	:	Prevent further leakage or spillage if sa Remove all sources of ignition. Soak up with inert absorbent material. Non-sparking tools should be used. Ensure adequate ventilation. Contact the proper local authorities.	fe to do so.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling	 For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Use only with adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid spark promoters. Ground/bond container and equipment. These alone may be insufficient to remove static electricity. Avoid contact with skin, eyes and clothing. Do not ingest. Keep away from heat and sources of ignition. Keep container closed when not in use.
Conditions for safe storage	 Store in original container. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in a dry, cool and well-ventilated place. Keep in properly labelled containers. To maintain product quality, do not store in heat or direct sunlight.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Engineering measures	:	Use only in well-ventilated areas.
		Ensure that eyewash station and safety shower are proximal to the work-station location.

Personal protective equipment

Respiratory protection : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe

FURNACE OIL



Version 4.0	Revision Date 2018/08/20	Print Date 2022/01/2/
	Revision Date 2010/00/20	Finit Date 2022/01/24
	working limits of the selected respira	ator.
Filter type	: organic vapour cartridge or canister under certain circumstances where are expected to exceed exposure lin by air-purifying respirators is limited pressure, air-supplied respirator if th uncontrolled release, exposure leve other circumstances where air-purify provide adequate protection.	may be permissible airborne concentrations nits. Protection provided . Use a positive- nere is any potential for els are unknown, or any ying respirators may not
Hand protection		
Material	: neoprene, nitrile, polyvinyl alcohol (your PPE provider for breakthrough glove that is best for you based on y should be realized that eventually a their imperviousness, will get perme Therefore, protective gloves should wear and tear. At the first signs of h should be changed.	PVA), Viton(R). Consult times and the specific your use patterns. It ny material regardless of ated by chemicals. be regularly checked for ardening and cracks, they
Remarks	: Chemical-resistant, impervious glov approved standard should be worn chemical products if a risk assessm necessary.	es complying with an at all times when handling ent indicates this is
Eye protection	: Wear face-shield and protective suit problems.	t for abnormal processing
Skin and body protection	: Choose body protection in relation t concentration and amount of dange the specific work-place.	o its type, to the rous substances, and to
Protective measures	: Wash contaminated clothing before	re-use.
Hygiene measures	: Remove and wash contaminated cle including the inside, before re-use. Wash face, hands and any exposed handling.	othing and gloves, I skin thoroughly after

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Bright oily liquid.
Colour	:	Clear to slightly yellow or green, undyed liquid. May be dyed red for taxation purposes.
Odour	:	Mild petroleum oil like.
Odour Threshold	:	No data available
рН	:	No data available
Pour point	:	-391 °C (-38 - 30 °F)
Boiling point/boiling range	:	150 - 371 °C (302 - 700 °F)

Internet: www.petro-canada.ca/msds Petro-Canada is a Suncor Energy business.

FURNACE OIL

000003001241



Version 4.0	Re	vision Date 2018/08/20	Print Date 2022/01/24
Flash point	: >= 4 Met	40 °C (104 °F) hod: closed cup	
Fire Point	: No	data available	
Auto-Ignition Temperature	: 225	°C (437 °F)	
Evaporation rate	: No	data available	
Flammability	: Flar Vap dist can	nmable in presence of open flames ours are heavier than air and may ance to sources of ignition and flas accumulate static charge and ignit	s, sparks and heat. travel considerable h back. This product e.
Upper explosion limit	: 6%	(V)	
Lower explosion limit	: 0.7	%(V)	
Vapour pressure	: 7.5	mmHg (20 °C / 68 °F)	
Relative vapour density	: 4.5		
Relative density	: 0.8	- 0.88	
Solubility(ies)			
Water solubility	: inso	luble	
Partition coefficient: n- octanol/water	: No	data available	
Viscosity			
Viscosity, kinematic	: 1.3	- 3.6 cSt (40 °C / 104 °F)	
Explosive properties	: Do exp sew	not pressurise, cut, weld, braze, so ose containers to heat or sources c er may create fire or explosion haz	lder, drill, grind or of ignition. Runoff to ard.

SECTION 10. STABILITY AND REACTIVITY

Possibility of hazardous reactions	:	Hazardous polymerisation does not occur. Stable under normal conditions.
Conditions to avoid	:	Extremes of temperature and direct sunlight.
Incompatible materials	:	Reactive with oxidising agents and acids.
Hazardous decomposition products	:	May release COx, NOx, SOx, H2S, smoke and irritating vapours when heated to decomposition.

FURNACE OIL

000003001241

Version 4.0



Print Date 2022/01/24

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure Eye contact Ingestion Inhalation Skin contact Skin Absorption

Acute toxicity

Product:

Components:	
Acute dermal toxicity	: Remarks: No data available
Acute inhalation toxicity	: Remarks: No data available
Acute oral toxicity	: Remarks: No data available

fuels, diesel: Acute oral toxicity	: LD50 (Rat): 7,500 mg/kg,
Acute dermal toxicity	: LD50 (Mouse): 24,500 mg/kg

Skin corrosion/irritation

Product:

Remarks: No data available

Serious eye damage/eye irritation

Product:

Remarks: No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

No data available

Reproductive toxicity

No data available

STOT - single exposure

No data available

STOT - repeated exposure

No data available Internet: www.petro-canada.ca/msds Petro-Canada is a Suncor Energy business.

FURNACE OIL

000003001241

Version 4.0



Print Date 2022/01/24

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity				
Product: Toxicity to fish :	Remarks: No data available			
Toxicity to daphnia and other : aquatic invertebrates	Remarks: No data available			
Toxicity to algae :	Remarks: No data available			
Toxicity to bacteria :	Remarks: No data available			
Persistence and degradability				
<u>Product:</u> Biodegradability :	Remarks: No data available			

Bioaccumulative potential

No data available

Mobility in soil

No data available

Other adverse effects

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods		
Waste from residues	:	The product should not be allowed to enter drains, water courses or the soil. Offer surplus and non-recyclable solutions to a licensed disposal company. Waste must be classified and labelled prior to recycling or disposal. Send to a licensed waste management company. Dispose of as hazardous waste in compliance with local and national regulations. Dispose of product residue in accordance with the instructions of the person responsible for waste disposal.
Contaminated packaging	:	Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

FURNACE OIL

000003001241

Version 4.0



IATA-DGR	
UN/ID No.	: UN 1202
Proper shipping name	: Heating oil, light
Class	: 3
Packing group	: 111
Labels	: Class 3 - Flammable Liquid
Packing instruction (cargo aircraft)	: 366
IMDG-Code UN number Proper shipping name	: UN 1202 : HEATING OIL LIGHT
Class	: 3
Packing group	: 111
Labels	: 3
EmS Code	: F-E, S-E
Marine pollutant	: no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

National Regulations

TDG UN number Proper shipping name	: UN 1202 : HEATING OIL LIGHT
Class Packing group Labels ERG Code	: 3 : III : 3 : 128
Marine pollutant	: no

SECTION 15. REGULATORY INFORMATION

This product has been classified according to the hazard criteria of the Hazardous Products Regulations (HPR) and the SDS contains all of the information required by the HPR.

The components of this product are reported in the following inventories:			
DSL	On the inventory, or in compliance with the inventory		
TSCA	All chemical substances in this product are either listed on the TSCA Inventory or are in compliance with a TSCA Inventory exemption.		
EINECS	On the inventory, or in compliance with the inventory		

SECTION 16. OTHER INFORMATION

For Copy of SDS	: Internet: www.petro-canada.ca/msds Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837- 1228 For Braduet Safety Information: 1.005-804-4752	
	For Product Salety Information: 1 905-804-4752	
ernet: www.petro-canada.ca/msds	Page	: 10

FURNACE OIL

000003001241

Version 4.0

Revision Date 2018/08/20

PETRO CANADA

Print Date 2022/01/24

Prepared by	:	Product Safety: +1 905-804-4752
Revision Date	:	2018/08/20

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

SAFETY DATA SHEET			
DIESEL FUEL			PETRO-CANADA
000003000395			
Version 6.3		Revision Date 2022/02/01	Print Date 2022/02/01
SECTION 1. IDENTIFICATION			
Product name	:	DIESEL FUEL	
Synonyms	:	Seasonal Diesel, #2 Diesel, #1 Di Heating Oil, OSX, D50, Arctic Die Diesel, Low Sulphur Diesel, LSD, ULSD, Mining Diesel, Naval Distil Diesel, Coloured Diesel, Furnace B1, B2, B5, Renewable Diesel ble is representative of volume %), Di rine Gas Oil, Marine Gas Oil Dyec	esel, #2 Heating Oil, #1 sel, Farm Diesel, Marine Ultra Low Sulphur Diesel, late, Dyed Diesel, Marked special, Biodiesel blend, end (RX where X is 2- 50, X iesel Low Cloud (LC), Ma-
Product code	:	103213, 100679, 100654, 100653 100634, 100631, 100638, 100641 100683, 100657, 100656, 100655 100681, 100661, 100659, 100667 100671, 100669, 100664, 100662 103204, 103180, 103179, 103193 103134, 103133, 103132, 103131 102763, 102755, 102302, 102744 101802, 100107, 100668, 100658 100460, 100065, 101796, 101793 101791, 100768, 100643, 100642 101797, 101788, 101789, 101787 100640, 100997, 100995, 100732	8, 100105, 100992, 100637, , 100635, 100632, 100684, 5, 100687, 100686, 100685, 7, 100666, 100665, 100682, 8, 103178, 103136, 103135, , 101799, 102907, 102762, 8, 101801, 100678, 100677, 8, 100911, 100663, 100652, 8, 101795, 101792, 101794, 2, 100103, 101798, 101800, 7, 102531, 100734, 100733, 2, 100731, 100994
Manufacturer or supplier's o	details	Petro-Canada P.O. Box 2844, 150 - 6th Avenue Calgary Alberta T2P 3E3 Canada, Telephone: 1-866-786-24	South-West 671
Emergency telephone num- ber	-	CHEMTREC: 1-800-424-9300 (to Suncor Energy: +1 403-296-3000	ll free) or +1 703-527-3887;
Recommended use of the	chen	nical and restrictions on use	
Recommended use	:	Diesel fuels are distillate fuels suit medium speed internal combustio sion ignition type. Mining diesels, naval distillates may have a highe	table for use in high and on engines of the compres- marine diesels, MDO and or flash point requirement.
Prepared by	:	Product Safety	

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance	Bright oily liquid.
Colour	Clear to yellow (This product may be dyed red for taxation purposes)

DIESEL FUEL

000003000395



Version 6.2	Revision Data 2022/02/04 Rrint Data 2022/02/04
Version 6.3	Revision Date 2022/02/01 Philit Date 2022/02/01
Odour	Mild petroleum oil like.
GHS Classification	· Catagory 3
Acute toxicity (Inhalation)	: Category 4
Skin irritation	: Category 2
Carcinogenicity	: Category 2
Specific target organ toxicity - single exposure	: Category 3 (Central nervous system)
Specific target organ toxicity - repeated exposure	: Category 2 (Liver, thymus, Bone)
Aspiration hazard	: Category 1
GHS label elements Hazard pictograms	
Signal word	: Danger
Hazard statements	 Flammable liquid and vapour. May be fatal if swallowed and enters airways. Causes skin irritation. Harmful if inhaled. May cause drowsiness or dizziness. Suspected of causing cancer. May cause damage to organs (Liver, thymus, Bone) through prolonged or repeated exposure.
Precautionary statements	 Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed. Ground and bond container and receiving equipment. Use explosion-proof electrical/ ventilating/ lighting equipment. Use non-sparking tools. Take action to prevent static discharges. Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash skin thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/ protective clothing/ eye protection/ face protection. Response:

DIESEL FUEL

000003000395



Version 6.3	Revision Date 2022/02/01	Print Date 2022/02/01
	IF SWALLOWED: Immediately IF ON SKIN (or hair): Take off clothing. Rinse skin with water. IF INHALED: Remove person t for breathing. Call a POISON O IF exposed or concerned: Get Do NOT induce vomiting. If skin irritation occurs: Get me Take off contaminated clothing In case of fire: Use dry sand, d foam to extinguish. Storage: Store in a well-ventilated place Store in a well-ventilated place Store locked up. Disposal: Dispose of contents/ container plant.	call a POISON CENTER/doctor. immediately all contaminated to fresh air and keep comfortable CENTER/doctor if you feel unwell. medical advice/ attention. dical advice/ attention. and wash it before reuse. ry chemical or alcohol-resistant . Keep container tightly closed. . Keep cool.
Potential Health Effects		
Primary Routes of Entry	: Eye contact Ingestion Inhalation Skin contact	
Aggravated Medical Condi- tion	: None known.	
Other hazards		
None known.		

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance /	Mixture	:	Mixture
-------------	---------	---	---------

Hazardous components

Chemical name	CAS-No.	Concentration
Kerosine (petroleum), hydrodesulfurized; Kero-	64742-81-0	48 - 100 %
sine — unspecified		
Kerosine (petroleum); Straight run kerosine	8008-20-6	
Fuels, diesel; Gasoil — unspecified	68334-30-5	
Alkanes, C10-20-branched and linear	928771-01-1	0 - 50 %
Fatty acids, C16-18 and C18-unsatd., Me esters	67762-38-3	0 - 20 %
All above concentrations are in percent by weight.		

SECTION 4. FIRST AID MEASURES

If inhaled	 Move to fresh air. Artificial respiration and/or oxygen may be necessary. Seek medical advice.
In case of skin contact	: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing
rnet: www.petro-canada.ca/msds	Page: 3/

DIESEL FUEL

000003000395



Version 6.3	Revision Date 2022/02/01	Print Date 2022/02/01
	and shoes. Wash skin thoroughly with soap a skin cleanser. Wash clothing before reuse.	nd water or use recognized
In case of eye contact	 Seek medical advice. Remove contact lenses. Rinse immediately with plenty of v for at least 15 minutes. Obtain medical attention 	vater, also under the eyelids,
If swallowed	 Rinse mouth with water. DO NOT induce vomiting unless of cian or poison control center. Never give anything by mouth to a Seek medical advice. 	lirected to do so by a physi- an unconscious person.
Most important symptoms and effects, both acute and delayed	: Harmful if inhaled. Respiratory, skin and eye irritation	n; nausea; cancer.
Notes to physician	 Treat symptomatically. For specialist advice physicians sl Information Service. 	hould contact the Poisons

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Dry chemical Carbon dioxide (CO2) Water fog. Foam
Unsuitable extinguishing media	:	Do NOT use water jet.
Specific hazards during fire- fighting	:	Cool closed containers exposed to fire with water spray.
Hazardous combustion prod- ucts	:	Carbon oxides (CO, CO2), nitrogen oxides (NOx), sulphur oxides (SOx), smoke and irritating vapours as products of incomplete combustion.
Further information	:	Prevent fire extinguishing water from contaminating surface water or the ground water system.
Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if nec- essary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protec- tive equipment and emer- gency procedures	:	For personal protection see section 8. Ensure adequate ventilation. Evacuate personnel to safe areas. Material can create slippery conditions.
Environmental precautions	:	If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	:	Prevent further leakage or spillage if safe to do so. Remove all sources of ignition. Soak up with inert absorbent material. Non-sparking tools should be used. Ensure adequate ventilation.
net: www.petro-canada.ca/msds		Page: 4

DIESEL FUEL

000003000395

Version 6.3

Revision Date 2022/02/01



Print Date 2022/02/01

Contact the proper local authorities.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling	For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area.
	In case of insufficient ventilation, wear suitable respiratory equipment.
	Avoid spark promoters. Ground/bond container and equip- ment. These alone may be insufficient to remove static elec- tricity
	Avoid contact with skin, eyes and clothing. Do not ingest.
	Keep away from heat and sources of ignition. Keep container closed when not in use.
Conditions for safe storage	Store in original container.
	Containers which are opened must be carefully resealed and kept upright to prevent leakage.
	Keep in a dry, cool and well-ventilated place.
	Keep in properly labelled containers.
	To maintain product quality, do not store in heat or direct sun- light.
	Ensure the storage containers are grounded/bonded.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of	Control parame- ters / Permissible	Basis
Kerosine (petroleum), hy- drodesulfurized; Kerosine — unspecified	64742-81-0	TWA	200 mg/m3 (As total hydro- carbon vapour)	ACGIH
		TWA	200 mg/m3 (total hydrocarbon vapor)	CA AB OEL
		TWA	525 mg/m3	CA ON OEL
		TWA	200 mg/m3 (As total hydro- carbon vapour)	ACGIH
		TWA	200 mg/m3 (total hydrocarbon vapor)	ACGIH
Kerosine (petroleum); Straight run kerosine	8008-20-6	TWA	200 mg/m3 (total hydrocarbon vapor)	CA BC OEL
		TWA	200 mg/m3 (total hydrocarbon vapor)	CA AB OEL
		TWA	200 mg/m3 (total hydrocarbon	ACGIH

Internet: www.petro-canada.ca/msds Petro-Canada is a Suncor Energy business.

DIESEL FUEL

000003000395

Version 6.3

Revision Date 2022/02/01

Print Date 2022/02/01

			vapor)		
Fuels, diesel; Gasoil — un- specified	68334-30-5	5 TWA	100 mg/m3 (total hydrocar- bons)	CA AB OEL	
		TWA (Va- pour and inhalable aerosols)	100 mg/m3 (total hydrocar- bons)	CA BC OEL	
		TWA (Inhal- able fraction and vapor)	100 mg/m3 (total hydrocar- bons)	ACGIH	
Engineering measures	: Adequate Limits are Use only ir Ensure tha to the work	Adequate ventilation to ensure that Occupational Exposure Limits are not exceeded. Use only in well-ventilated areas. Ensure that eyewash station and safety shower are proximal to the work-station location.			
Personal protective equipme	ent				
Respiratory protection	 Concentra Use respir ventilation that expos Respirator exposure I working lin organic va der certain expected t air-purifyin air-supplie release, ex stances wh quate prote 	tion in air determin atory protection un is provided or exp ures are within rec selection must be evels, the hazards hits of the selected pour cartridge or c circumstances wh o exceed exposure g respirators is lim d respirator if there cosure levels are here air-purifying re	es protection needed less adequate local osure assessment de ommended exposure based on known or of the product and the respirator. anister may be permi- tere airborne concent e limits. Protection p ited. Use a positive- e is any potential for unknown, or any othe espirators may not pro-	d. exhaust emonstrates e guidelines. anticipated ne safe issible un- trations are rovided by pressure, uncontrolled er circum- rovide ade-	
Material	: neoprene, your PPE glove that should be their imper Therefore, wear and t should be	neoprene, nitrile, polyvinyl alcohol (PVA), Viton(R). Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns. It should be realized that eventually any material regardless of their imperviousness, will get permeated by chemicals. Therefore, protective gloves should be regularly checked for wear and tear. At the first signs of hardening and cracks, they should be changed.			
Remarks	: Chemical- approved s chemical p	resistant, imperviou standard should be products if a risk as	us gloves complying worn at all times wh sessment indicates t	with an nen handling his is nec-	
Eye protection	: Wear face	-shield and protect	ive suit for abnormal	processing	
Skin and body protection	: Choose bo tration and cific work-	bdy protection in re amount of danger place.	lation to its type, to t ous substances, and	he concen- I to the spe-	
Protective measures Hygiene measures	: Wash conf : Remove a ing the ins	aminated clothing nd wash contamina ide, before re-use.	before re-use. ated clothing and glo	ves, includ-	
rnet: www.petro-canada.ca/msds	0	,		Page: $6/12$	



DIESEL FUEL

000003000395



Version 6.3

Revision Date 2022/02/01

Print Date 2022/02/01

Wash face, hands and any exposed skin thoroughly after handling.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Bright oily liquid.
Colour	:	Clear to yellow (This product may be dyed red for taxation purposes)
Odour	:	Mild petroleum oil like.
Odour Threshold	:	No data available
рН	:	No data available
Melting point	:	No data available
Boiling point/boiling range	:	150 - 371 °C (302 - 700 °F)
Decomposition temperature		No data available
Flash point	:	> 40 °C (104 °F) Method: closed cup
Auto-Ignition Temperature	:	204 °C (399 °F)
Evaporation rate	:	No data available
Flammability	:	Flammable in presence of open flames, sparks and heat. Va- pours are heavier than air and may travel considerable dis- tance to sources of ignition and flash back. This product can accumulate static charge and ignite.
Upper explosion limit	:	6 %(V)
Lower explosion limit	:	0.7 %(V)
Vapour pressure	:	7.5 mmHg (20 °C / 68 °F)
Relative vapour density	:	4.5
Relative density	:	0.8 - 0.88
Solubility(ies)		
Water solubility	:	insoluble
Partition coefficient: n- octanol/water	:	No data available
Viscosity		
Viscosity, kinematic	:	1.3 - 4.1 cSt (40 °C / 104 °F)

DIESEL FUEL

000003000395

Version 6.3

Revision Date 2022/02/01



Print Date 2022/02/01

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Stable at normal ambient temperature and pressure.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reac-	:	Hazardous polymerisation does not occur.
tions		
Conditions to avoid	:	Extremes of temperature and direct sunlight.
Incompatible materials	:	Reactive with oxidising agents and acids.
Hazardous decomposition	:	May release COx, NOx, SOx, smoke and irritating vapours
products		when heated to decomposition.
		-

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes Eye contact Ingestion	s of exposure
Inhalation Skin contact	
Acute toxicity	
Product:	
Acute oral toxicity	: Remarks: Based on available data, the classification criteria are not met.
Acute inhalation toxicity	: Acute toxicity estimate: 1.5 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: Calculation method Assessment: The component/mixture is moderately toxic after short term inhalation. Remarks: Harmful if inhaled.
Acute dermal toxicity	: Assessment: The substance or mixture has no acute dermal toxicity
<u>Components:</u> Kerosine (petroleum), hydr Acute oral toxicity	odesulfurized; Kerosine — unspecified: : LD50 (Rat): > 5,000 mg/kg,
Acute inhalation toxicity	: LC50 (Rat): > 5.2 mg/l Exposure time: 4 hrs Test atmosphere: dust/mist
Acute dermal toxicity	: LD50 (Rabbit): > 2,000 mg/kg,
Kerosine (petroleum); Strai	i ght run kerosine: : LD50 (Rat): > 5,000 mg/kg,
Acute inhalation toxicity	: LC50 (Rat): > 5 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity net: www.petro-canada.ca/msds -Canada is a Suncor Energy business.	: LD50 (Rabbit): > 2,000 mg/kg, Page: 8 ™ Trademark of Suncor Energy Inc. Used under lic

DIESEL FUEL

000003000395

Version 6.3



Print Date 2022/02/01

Fuels, diesel; Gasoil — unspecified:

Acute oral toxicity	: LD50 (Rat): 7,500 mg/kg,
Acute inhalation toxicity	: LC50 (Rat): 4.1 mg/l Exposure time: 4 h Test atmosphere: vapour
Acute dermal toxicity	: LD50 (Mouse): 24,500 mg/kg

Skin corrosion/irritation

Product:

Remarks: Causes skin irritation.

Serious eye damage/eye irritation

Product:

Remarks: Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation

Product:

Remarks: Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Product:

Germ cell mutagenicity-	Based on available data, the classification criteria are not
Assessment	met.

Carcinogenicity

Product:

Carcinogenicity - Assessment Suspected of causing cancer.

Reproductive toxicity

Product:

Reproductive toxicity -Based on available data, the classification criteria are notAssessmentmet.

STOT - single exposure

Product:

Target Organs: Central nervous system Remarks: May cause drowsiness or dizziness.

DIESEL FUEL

000003000395

Version 6.3

Revision Date 2022/02/01



Print Date 2022/02/01

STOT - repeated exposure

Product:

Target Organs: Liver, thymus, Bone Remarks: May cause damage to organs through prolonged or repeated exposure.

No data available

Aspiration toxicity

Product:

May be fatal if swallowed and enters airways.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish	:	Remarks: No data available
Toxicity to daphnia and other aquatic invertebrates	:	Remarks: No data available
Toxicity to algae	:	Remarks: No data available
Toxicity to bacteria	:	Remarks: No data available
Persistence and degradabilit	у	
-		
Product:		
Product: Biodegradability	:	Remarks: No data available
Product: Biodegradability Bioaccumulative potential	:	Remarks: No data available
Product: Biodegradability Bioaccumulative potential No data available	:	Remarks: No data available
Product: Biodegradability Bioaccumulative potential No data available Mobility in soil	:	Remarks: No data available

No data available

Other adverse effects

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods	
Waste from residues	 The product should not be allowed to enter drains, water courses or the soil. Offer surplus and non-recyclable solutions to a licensed disposal company. Waste must be classified and labelled prior to recycling or disposal. Send to a licensed waste management company.

DIESEL FUEL

000003000395



Version 6.3	Revision Date 2022/02/01	Print Date 2022/02/01
Contaminated packaging	Dispose of as hazardous waste in national regulations. Dispose of product residue in accor of the person responsible for wast : Contact local or business unit auth posal of product.	compliance with local and ordance with the instructions e disposal. norities for guidance on dis-

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR		
UN/ID No.	:	UN 1202
Proper shipping name	:	Diesel fuel
Class	:	3
Packing group	:	III
Labels	:	Class 3 - Flammable Liquid
Packing instruction (cargo aircraft)	:	366
IMDG-Code UN number Proper shipping name Class Packing group Labels EmS Code Marine pollutant		UN 1202 DIESEL FUEL 3 III 3 F-E, S-E yes
Transport in bulk according t	0	Annex II of MARPOL 73/78 and the IBC Code
National Regulations		

TDG		
UN number	:	UN 1202
Proper shipping name	:	DIESEL FUEL
Class	:	3
Packing group	:	III
Labels	:	3
ERG Code	:	128
Marine pollutant	:	yes

SECTION 15. REGULATORY INFORMATION

This product has been classified according to the hazard criteria of the Hazardous Products Regulations (HPR) and the SDS contains all of the information required by the HPR.

The components of this product are reported in the following inventories:DSLOn the inventory, or in compliance with the inventory

DIESEL FUEL

000003000395

Version 6.3



Print Date 2022/02/01

SECTION 16. OTHER INFORMATION

For Copy of SDS	 Internet: www.petro-canada.ca/msds Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837- 1228 For Product Safety Information: 1 905-804-4752
Prepared by	: Product Safety
Revision Date	: 2022/02/01

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

GASOLINE, UNLEADED

000003000644

Version 3.1



Print Date 2022/01/24

SECTION 1. IDENTIFICATION

GASOLINE, UNLEADED					
TN-PE-TM15-X00-1499; LVB87, Regular, Unleaded Gasoline (US Grade), Mid-Grade, Plus, Super, WinterGas, SummerGas, Supreme, SuperClean, SuperClean WinterGas, RegularClean, PlusClean, Premium, marked or dyed gasoline, TQRUL, transitional quality regular unleaded, BOB, Blendstock for Oxygenate Blending, Conventional Gasoline, RUL, MUL, SUL, PUL.					
100127, 100126, 101823, 100507, 101811, 101814, 100141, 101813, 101810, 101812, 100063, 101822, 100138, 101821, 100064, 101820, 101819, 100506, 101818, 101816, 101817, 100488					
Petro-Canada P.O. Box 2844, 150 - 6th Avenue South-West Calgary Alberta T2P 3E3 Canada, Telephone: 1-866-786-2671					
CHEMTREC: 1-800-424-9300 (toll free) or +1 703-527-3887; Suncor Energy: +1 403-296-3000					
Recommended use of the chemical and restrictions on use					
Unleaded gasoline is used in spark ignition engines including motor vehicles, inboard and outboard boat engines, small engines such as chain saws and lawn mowers, and recreational vehicles.					

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance	Clear liquid.
Colour	Clear to slightly yellow or green, undyed liquid. May be dyed red for taxation purposes.
Odour	Gasoline

GHS Classification

Flammable liquids	: Category 1
Skin irritation	: Category 2

GASOLINE, UNLEADED

000003000644



Version 3.1	Revision Date 2021/02/18	Print Date 2022/01/24
Carcinogenicity	: Category 1A	
Reproductive toxicity	: Category 2	
Specific target organ toxicity - single exposure	: Category 3 (Central nervous system	n)
Specific target organ toxicity - repeated exposure	: Category 1	
Aspiration hazard	: Category 1	
GHS label elements		
Hazard pictograms		
Signal word	: Danger	
Hazard statements	 Extremely flammable liquid and vap May be fatal if swallowed and enter Causes skin irritation. May cause drowsiness or dizziness May cause genetic defects. May cause cancer. Suspected of damaging fertility or t Causes damage to organs through exposure. 	oour. 's airways. s. he unborn child. prolonged or repeated
Precautionary statements	 Prevention: Obtain special instructions before u Do not handle until all safety preca understood. Keep away from heat, hot surfaces other ignition sources. No smoking Keep container tightly closed. Ground and bond container and ree Use explosion-proof electrical/ veri Use non-sparking tools. Take action to prevent static discha Do not breathe dust/ fume/ gas/ mi Wash skin thoroughly after handlin Do not eat, drink or smoke when us Use only outdoors or in a well-vent Wear protective gloves/ protective protection. Response: IF SWALLOWED: Immediately call IF ON SKIN (or hair): Take off imm clothing. Rinse skin with water. IF INHALED: Remove person to free for breathing. Call a POISON CEN IF exposed or concerned: Get med 	Ise. utions have been read and , sparks, open flames and ceiving equipment. tilating/ lighting equipment. arges. st/ vapours/ spray. g. sing this product. ilated area. clothing/ eye protection/ face a POISON CENTER/doctor. ediately all contaminated esh air and keep comfortable TER/doctor if you feel unwell. lical advice/ attention.

000003000644

GASOLINE, UNLEADED



Version 3.1	Revision Date 2021/02/18	Print Date 2022/01/24
	Do NOT induce vomiting. If skin irritation occurs: Get medica Take off contaminated clothing an In case of fire: Use dry sand, dry of foam to extinguish. Storage: Store in a well-ventilated place. Ko Store in a well-ventilated place. Ko Store locked up. Disposal: Dispose of contents/ container to plant.	al advice/ attention. d wash it before reuse. chemical or alcohol-resistant eep container tightly closed. eep cool. an approved waste disposal
Potential Health Effects		
Primary Routes of Entry	: Eye contact Ingestion Inhalation Skin contact	
Aggravated Medical Condition	: None known.	
Other hazards None known.		
IARC	Group 1: Carcinogenic to humans	
	Benzene	71-43-2
ACGIH	Confirmed human carcinogen	
	Benzene	71-43-2
	Confirmed animal carcinogen with ur humans	nknown relevance to
	Gasoline	86290-81-5
	Ethanol	64-17-5

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration
Gasoline; Low boiling point naphtha -unspecified	86290-81-5	95 - 100 %
Internet: www.petro-canada.ca/msds		Page: 3 / 13


GASOLINE, UNLEADED

000003000644

Version 3.1	Revision Date 2021/02/18	Print Date 2022/01/24
		4 40.00

to	luene	108-88-3	1 - 40 %
be	enzene	71-43-2	0.5 - 1.5 %
et	hanol	64-17-5	0.1 - 0.3 %
Al	All above concentrations are in percent by weight.		

SECTION 4. FIRST AID MEASURES

If inhaled :	Move to fresh air. Artificial respiration and/or oxygen may be necessary. Seek medical advice.
In case of skin contact :	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Wash clothing before reuse. Seek medical advice.
In case of eye contact :	Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.
If swallowed :	Rinse mouth with water. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Seek medical advice.
Most important symptoms : and effects, both acute and delayed	Inhalation may cause central nervous system effects. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. Chronic exposure to benzene may result in increased risk of leukemia and other blood disorders.
Notes to physician :	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	: Dry chemical Carbon dioxide (CO2) Water fog. Foam
Unsuitable extinguishing media	: Do NOT use water jet.

GASOLINE, UNLEADED

000003000644



Version 3.1	Revision Date 2021/02/18	Print Date 2022/01/24
Specific hazards during firefighting	: Cool closed containers exposed to	fire with water spray.
Hazardous combustion products	: Carbon oxides (CO, CO2), nitroge aromatic hydrocarbons, phenols, a and irritating vapours as products of	n oxides (NOx), polynuclear Ildehydes, ketones, smoke of incomplete combustion.
Further information	: Prevent fire extinguishing water from water or the ground water system.	om contaminating surface
Special protective equipment for firefighters	: Wear self-contained breathing app wear. Wear a positive-pressure supplied facepiece.	aratus and full protective

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	For personal protection see section 8. Ensure adequate ventilation. Evacuate personnel to safe areas. Material can create slippery conditions.
Environmental precautions	:	If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up		Prevent further leakage or spillage if safe to do so. Remove all sources of ignition. Soak up with inert absorbent material. Non-sparking tools should be used. Ensure adequate ventilation. Contact the proper local authorities.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling :	For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Use only with adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid spark promoters. Ground/bond container and equipment. These alone may be insufficient to remove static electricity. Avoid contact with skin, eyes and clothing. Do not ingest. Keep away from heat and sources of ignition. Keep container closed when not in use.
Conditions for safe storage :	Store in original container. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in a dry, cool and well-ventilated place. Keep in properly labelled containers. To maintain product quality, do not store in heat or direct
Internet: www.petro-canada.ca/msds	Page: 5

GASOLINE, UNLEADED

000003000644

PETRO-CANADA

Version 3.1

Revision Date 2021/02/18

Print Date 2022/01/24

sunlight.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type	Control	Basis
		(Form of	parameters /	
		exposure)	Permissible	
			concentration	
toluene	108-88-3	TWA	50 ppm	CA AB OEL
			188 mg/m3	
		TWA	20 ppm	CA BC OEL
		TWAEV	50 ppm	CA QC OEL
			188 mg/m3	
		TWA	20 ppm	ACGIH
benzene	71-43-2	TWA	0.5 ppm	CA AB OEL
			1.6 mg/m3	
		STEL	2.5 ppm	CA AB OEL
			8 mg/m3	
		TWA	0.5 ppm	CA BC OEL
		STEL	2.5 ppm	CA BC OEL
		TWA	0.5 ppm	CA ON OEL
		STEL	2.5 ppm	CA ON OEL
		TWAEV	1 ppm	CA QC OEL
			3 mg/m3	
		STEV	5 ppm	CA QC OEL
			15.5 mg/m3	
		TWA	0.5 ppm	ACGIH
		STEL	2.5 ppm	ACGIH
Gasoline; Low boiling point naphtha -unspecified	86290-81-5	TWA	300 ppm	CA AB OEL
		STEL	500 ppm	CA AB OEL
		TWA	300 ppm	CA BC OEL
		STEL	500 ppm	CA BC OEL
		TWA	300 ppm	ACGIH
		STEL	500 ppm	ACGIH
ethanol	64-17-5	TWA	1,000 ppm	CA AB OEL
			1,880 mg/m3	
		STEL	1,000 ppm	CA BC OEL
		TWAEV	1,000 ppm	CA QC OEL
			1,880 mg/m3	
		STEL	1,000 ppm	ACGIH

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Samplin g time	Permissible concentratio n	Basis
Toluene	108-88-3	Toluene	In blood	Prior to last shift of workwee k	0.02 mg/l	ACGIH BEI

GASOLINE, UNLEADED

000003000644

Ver



Version 3.1	Revision Date 2021/02/18	Print Date 2022/01/24
	Toluene Urine	End of 0.03 mg/I ACGIH shift (As BEI soon as possible after exposure ceases)
Engineering measures	Adequate ventilation to ensur Limits are not exceeded. Use only in well-ventilated are Ensure that eyewash station a to the work-station location.	e that Occupational Exposure eas. and safety shower are proximal
Personal protective equipmen	t	
Respiratory protection	Concentration in air determine Use respiratory protection unly ventilation is provided or expo- that exposures are within reco Respirator selection must be exposure levels, the hazards working limits of the selected	es protection needed. less adequate local exhaust osure assessment demonstrates ommended exposure guidelines. based on known or anticipated of the product and the safe respirator.
Filter type	A NIOSH-approved air-purifyi vapour cartridge or canister m circumstances where airborne to exceed exposure limits. Pr purifying respirators is limited supplied respirator if there is a release, exposure levels are o circumstances where air-purif provide adequate protection.	ing respirator with an organic hay be permissible under certain e concentrations are expected rotection provided by air- . Use a positive-pressure, air- any potential for uncontrolled unknown, or any other fying respirators may not
Hand protection Material	polyvinyl alcohol (PVA), Viton for breakthrough times and th you based on your use patter eventually any material regard will get permeated by chemic should be regularly checked f signs of hardening and cracks	n(R). Consult your PPE provider the specific glove that is best for rns. It should be realized that dless of their imperviousness, als. Therefore, protective gloves for wear and tear. At the first s, they should be changed.
Remarks	Chemical-resistant, imperviou approved standard should be chemical products if a risk as necessary.	us gloves complying with an worn at all times when handling sessment indicates this is
Eye protection	Wear face-shield and protecti problems.	ive suit for abnormal processing
Skin and body protection	Choose body protection in rel concentration and amount of the specific work-place.	ation to its type, to the dangerous substances, and to
Protective measures	Wash contaminated clothing I	before re-use.
Internet: www.petro-canada.ca/msds Petro-Canada is a Suncor Energy business.	™ Tra	Page: 7 / 13 demark of Suncor Energy Inc. Used under licence.

GASOLINE, UNLEADED



000003000644

Version 3.1	Revision Date 2021/02/18	Print Date 2022/01/24
Hygiene measures :	Remove and wash contaminated clothir including the inside, before re-use. Wash face, hands and any exposed ski handling.	ng and gloves, n thoroughly after

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Clear liquid.
Colour	:	Clear to slightly yellow or green, undyed liquid. May be dyed red for taxation purposes.
Odour	:	Gasoline
Odour Threshold	:	No data available
рН	:	No data available
Melting point	:	No data available
Boiling point/boiling range	:	25 - 225 °C (77 - 437 °F)
Decomposition temperature		No data available
Flash point	:	-5038 °C (-5836 °F) Method: Tagliabue.
Auto-Ignition Temperature	:	257 °C (495 °F)
Evaporation rate	:	No data available
Flammability	:	Extremely flammable in presence of open flames, sparks, shocks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. Rapid escape of vapour may generate static charge causing ignition. May accumulate in confined spaces.
Upper explosion limit	:	7.6 %(V)
Lower explosion limit	:	1.3 %(V)
Vapour pressure	:	< 802.5 mmHg (20 °C / 68 °F)
Relative vapour density	:	3
Relative density	:	0.685 - 0.8
Solubility(ies)		
Water solubility	:	insoluble
Partition coefficient: n- octanol/water	:	No data available
Viscosity		

GASOLINE, UNLEADED

000003000644



Print Date 2022/01/24 Version 3.1 Revision Date 2021/02/18

Viscosity, kinematic

: No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Hazardous polymerisation does not occur.
Conditions to avoid	:	Extremes of temperature and direct sunlight.
Incompatible materials	:	Reactive with oxidising agents, acids and interhalogens.
Hazardous decomposition products	:	May release COx, NOx, phenols, polycyclic aromatic hydrocarbons, aldehydes, ketones, smoke and irritating vapours when heated to decomposition.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely route	es of exposure
Eye contact	
Ingestion	
Skin contact	
Acute toxicity	
Product:	
Acute oral toxicity	: Remarks: Based on available data, the classification criteria are not met.
Acute inhalation toxicity	: Remarks: Based on available data, the classification criteria are not met.
Acute dermal toxicity	: Remarks: Based on available data, the classification criteria are not met.
<u>Components:</u>	
Gasoline; Low boiling poin	nt naphtha -unspecified:
Acute oral toxicity	: LD50 (Rat): 13,600 mg/kg,
Acute dermal toxicity	: LD50 (Rabbit): > 3,750 mg/kg,
toluene:	
Acute oral toxicity	: LD50 (Rat): 5,580 mg/kg,
Acute inhalation toxicity	: LC50 (Rat): > 20 mg/l Exposure time: 4 h Test atmosphere: vapour
ternet: www.petro-canada.ca/msds	Page:
Notes Oceando is a Oceano Essentia de la	The Tanada set of Overson Frances has the deside

GASOLINE, UNLEADED

000003000644



Version 3.1	Revision Date 2021/02/18	Print Date 2022/01/24
Acute dermal toxicity	: LD50 (Rabbit): 12,125 mg/kg,	
benzene: Acute oral toxicity	: LD50 (Rat): 2,990 mg/kg,	
Acute inhalation toxicity	: LC50 (Rat): 13700 ppm Exposure time: 4 h Test atmosphere: vapour	
Acute dermal toxicity	: LD50 (Rabbit): > 8,240 mg/kg,	
ethanol: Acute oral toxicity	: LD50 (Rat): 7,060 mg/kg,	
Acute inhalation toxicity	: LC50 (Rat): > 32380 ppm Exposure time: 4 h Test atmosphere: vapour	
Skin corrosion/irritation		
Product:		
Remarks: Causes skin irritation	٦.	

Serious eye damage/eye irritation

Product:

Remarks: Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation

Product:

Remarks: Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Product:

Germ cell mutagenicity-	May cause genetic defects.
Assessment	

Carcinogenicity

Product:

Carcinogenicity -Assessment May cause cancer.

Reproductive toxicity

Product:

Reproductive toxicity - Suspecter Assessment

Suspected of damaging fertility or the unborn child.

GASOLINE, UNLEADED

000003000644

Version 3.1

Print Date 2022/01/24

STOT - single exposure

Product:

Remarks: May cause drowsiness or dizziness.

STOT - repeated exposure

Product:

Remarks: Causes damage to organs through prolonged or repeated exposure.

No data available

Aspiration toxicity

Product:

May be fatal if swallowed and enters airways.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Ρ	r	0	dı	J	ct	:

Toxicity to fish	:	Remarks: No data available
Toxicity to daphnia and other aquatic invertebrates	:	Remarks: No data available
Toxicity to algae	:	Remarks: No data available
Toxicity to bacteria	:	Remarks: No data available
Persistence and degradabilit	у	
Product:		
Biodegradability	:	Remarks: No data available
Bioaccumulative potential		
No data available		
Mobility in soil		
No data available		
Other adverse effects		
No data available		

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Internet: www.petro-canada.ca/msds Petro-Canada is a Suncor Energy business.

GASOLINE, UNLEADED

000003000644



Version 3.1	Revision Date 2021/02/18	Print Date 2022/01/24
Waste from residues	: The product should not be allowed courses or the soil.	d to enter drains, water
	Offer surplus and non-recyclable s disposal company.	solutions to a licensed
	Waste must be classified and labe disposal.	elled prior to recycling or
	Send to a licensed waste manage	ment company.
	Dispose of as hazardous waste in national regulations.	compliance with local and
	Dispose of product residue in according of the person responsible for wast	ordance with the instructions te disposal.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR	
UN/ID No.	: UN 1203
Proper shipping name	: Gasoline
Class	: 3
Packing group	: 11
Labels	: Class 3 - Flammable Liquid
Packing instruction (cargo aircraft)	: 364
IMDG-Code UN number Proper shipping name	: UN 1203 : GASOLINE
Class Packing group Labels EmS Code Marine pollutant	: 3 : II : 3 : F-E, S-E : no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

National Regulations

TDG	
UN number	: UN 1203
Proper shipping name	: GASOLINE
Class	: 3
Packing group	: 11
Labels	: 3
ERG Code	: 128
Marine pollutant	: no

SECTION 15. REGULATORY INFORMATION

GASOLINE, UNLEADED

000003000644

PETRO CANADA

Version 3.1

Revision Date 2021/02/18

Print Date 2022/01/24

This product has been classified according to the hazard criteria of the Hazardous Products Regulations (HPR) and the SDS contains all of the information required by the HPR.

The components of this product are reported in the following inventories:DSLOn the inventory, or in compliance with the inventory

SECTION 16. OTHER INFORMATION

For Copy of SDS	 Internet: www.petro-canada.ca/msds Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837- 1228 For Product Safety Information: 1 905-804-4752
Prepared by	: Product Safety
Revision Date	: 2021/02/18

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.



Section 1. Identification

Product name	Castrol Vecton 10W-30 FA-4
SDS #	469317
Code	469317-US06
Relevant identified uses of	f the substance or mixture and uses advised against
Product use	Engine Oils. For specific application advice see appropriate Technical Data Sheet or consult our company representative.
Supplier	BP Lubricants USA Inc. 1500 Valley Road Wayne, NJ 07470 Telephone: (973) 633-2200
EMERGENCY HEALTH	1 (800) 447-8735
	Outside the US: +1 703-527-3887 (CHEMTREC)
EMERGENCY SPILL INFORMATION:	1 (800) 424-9300 CHEMTREC (USA)

Section 2. Hazards identification

OSHA/HCS status	This material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the	Not classified.
substance or mixture	
GHS label elements	
Signal word	No signal word.
Hazard statements	No known significant effects or critical hazards.
Precautionary statements	
General	Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.
Prevention	Not applicable.
Response	Not applicable.
Storage	Not applicable.
Disposal	Not applicable.
Hazards not otherwise	Defatting to the skin.
classified	USED ENGINE OILS
	Used engine oil may contain hazardous components which have the potential to cause skin cancer.
	See Toxicological Information, section 11 of this Safety Data Sheet.

Product name	Castrol Vecton 10W-30 FA-4	
Version 2	Date of issue 11/07/2016.	

Section 3. Composition/information on ingredients

Highly refined base oil (IP 346 DMSO extract < 3%). Proprietary performance additives.

Substance/mixture Mixture		
Ingredient name	CAS number	%
Base oil - highly refined	Varies - See Key to abbreviations	≥75 - ≤90
zinc bis[O-(6-methylheptyl)] bis[O-(sec-butyl)] bis(dithiophosphate) Molybdenum polysulfide long chain alkyl dithiocarbamide complex	93819-94-4 Not available.	≤3 ≤0.3

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.
Skin contact	Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur.
Inhalation	If inhaled, remove to fresh air. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. Get medical attention if symptoms occur.
Ingestion	To not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training.

Most important symptoms/effects, acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. Treatment should in general be symptomatic and directed to relieving any effects.
Specific treatments	No specific treatment.

Section 5. Fire-fighting measures

Extinguishing media	
Suitable extinguishing media	In case of fire, use foam, dry chemical or carbon dioxide extinguisher or spray.
Unsuitable extinguishing media	Do not use water jet.
Specific hazards arising from the chemical	In a fire or if heated, a pressure increase will occur and the container may burst.
Hazardous combustion products	Combustion products may include the following: carbon dioxide carbon monoxide nitrogen oxides sulfur oxides phosphorus oxides metal oxide/oxides

Product name	Castrol Vector	n 10W-30 FA-4		Product code	469317-US06	Page: 2/9
Version 2	Date of issue	11/07/2016.	Format	US	Language	ENGLISH
				(US)		(ENGLISH)

Section 5. Fire-fighting measures

Special protective actions for fire-fighters	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
Special protective equipment for fire-fighters	Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Section 6. Accidental release measures

Personal precautions, protecti	ve equipment and emergency procedures		
For non-emergency personnel	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment. Floors may be slippery; use care to avoid falling.		
For emergency responders			
Environmental precautions	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).		
Methods and materials for con	tainment and cleaning up		
Small spill	Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.		
Large spill	Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor.		

Section 7. Handling and storage

Precautions for safe handling	
Protective measures	Put on appropriate personal protective equipment (see Section 8).
Advice on general occupational hygiene	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Store and use only in equipment/containers designed for use with this product. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
Not suitable	Prolonged exposure to elevated temperature

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Product name	Castrol Vecton 10W-30 FA-4		Product code	469317-US06	Page: 3/9
Version 2	Date of issue 11/07/2016.	Format	US	Language	ENGLISH
			(US)		(ENGLISH)

Base oil - highly refined		ACGIH TLV (United States). TWA: 5 mg/m ³ 8 hours. Issued/Revised: 11/2009 Form: Inhalable fraction OSHA PEL (United States). TWA: 5 mg/m ³ 8 hours. Issued/Revised:
		6/1993
zinc bis[O-(6-methylheptyl)] b	is[O-(sec-butyl)] bis(dithiophosphate)	None.
Molybdenum polysulfide long	chain alkyl dithiocarbamide complex	None.
Appropriate engineering controls	All activities involving chemicals shou exposures are adequately controlled. considered after other forms of contro suitably evaluated. Personal protectiv standards, be suitable for use, be kep Your supplier of personal protective e selection and appropriate standards. organisation for standards. Provide exhaust ventilation or other e concentrations below their respective The final choice of protective equipme important to ensure that all items of p	Id be assessed for their risks to health, to ensure Personal protective equipment should only be of measures (e.g. engineering controls) have been ve equipment should conform to appropriate of in good condition and properly maintained. equipment should be consulted for advice on For further information contact your national engineering controls to keep the relevant airborne occupational exposure limits. ent will depend upon a risk assessment. It is personal protective equipment are compatible.
Environmental exposure controls	Emissions from ventilation or work pr comply with the requirements of envir fume scrubbers, filters or engineering necessary to reduce emissions to acc	ocess equipment should be checked to ensure they ronmental protection legislation. In some cases, modifications to the process equipment will be ceptable levels.
Individual protection measure	<u>es</u>	
Hygiene measures	Wash hands, forearms and face thore eating, smoking and using the lavator Appropriate techniques should be use Wash contaminated clothing before r showers are close to the workstation	oughly after handling chemical products, before ry and at the end of the working period. ed to remove potentially contaminated clothing. eusing. Ensure that eyewash stations and safety location.
Eye/face protection	Safety glasses with side shields.	
Skin protection		
Hand protection	Wear protective gloves if prolonged or resistant gloves. Recommended: Nit depends upon the chemicals being ha condition of the gloves (even the best repeated chemical exposures). Most before they must be discarded and re material handling practices vary, safe intended application. Gloves should the manufacturer and with a full assessme	or repeated contact is likely. Wear chemical rile gloves. The correct choice of protective gloves andled, the conditions of work and use, and the t chemically resistant glove will break down after gloves provide only a short time of protection eplaced. Because specific work environments and ty procedures should be developed for each herefore be chosen in consultation with the supplier/ ient of the working conditions.
	Consult your supervisor or Standard (instructions.	Operating Procedure (S.O.P) for special handling
Body protection	Use of protective clothing is good ind Cotton or polyester/cotton overalls wi contamination that will not soak throu regular basis. When the risk of skin e if there is a risk of splashing) then che suits and boots will be required. Personal protective equipment for the performed and the risks involved and this product.	ustrial practice. Il only provide protection against light superficial gh to the skin. Overalls should be laundered on a exposure is high (e.g. when cleaning up spillages or emical resistant aprons and/or impervious chemical e body should be selected based on the task being should be approved by a specialist before handling
Other skin protection	Appropriate footwear and any addition based on the task being performed an specialist before handling this product	nal skin protection measures should be selected nd the risks involved and should be approved by a t.

Product name	Castrol Vecton 10W-30 FA-4	Produc	t code 469317-US06	Page: 4/9
Version 2	Date of issue 11/07/2016.	Format US	Langu	age ENGLISH
		(US)		(ENGLISH)

Section 8. Exposure controls/personal protection

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment. The correct choice of respiratory protection depends upon the chemicals being handled, the conditions of work and use, and the condition of the respiratory equipment. Safety procedures should be developed for each intended application. Respiratory protection equipment should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Section 9. Physical and chemical properties

<u>Appearance</u>	
Physical state	Liquid.
Color	Brown.
Odor	Not available.
Odor threshold	Not available.
рН	Not available.
Melting point	Not available.
Boiling point	Not available.
Flash point	Closed cup: 204°C (399.2°F) [Pensky-Martens.]
Pour point	-42 °C
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable. Based on - Physical state
Lower and upper explosive (flammable) limits	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Density	870 kg/m³ (0.87 g/cm³) at 15°C
Solubility	insoluble in water.
Partition coefficient: n- octanol/water	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Kinematic: 69.33 mm²/s (69.33 cSt) at 40°C Kinematic: 10.52 mm²/s (10.52 cSt) at 100°C

Section 10. Stability and reactivity

Reactivity	No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.	
Chemical stability	The product is stable.	
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerization will not occur.	
Conditions to avoid	Avoid all possible sources of ignition (spark or flame).	
Incompatible materials	Reactive or incompatible with the following materials: oxidizing materials.	
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.	

Product name	Castrol Vecton 10W-30 FA-4	Product co	de 469317-US06	Page: 5/9
Version 2	Date of issue 11/07/2016.	Format US	Language	ENGLISH
		(US)		(ENGLISH)

Section 11. Toxicological information

Information on toxicological effects

Information on the likely routes of exposure	outes of entry anticipated: Dermal, Inhalation.	
Potential acute health effects		
Eye contact	No known significant effects or critical hazards.	
Skin contact	No known significant effects or critical hazards.	
Inhalation	Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.	
Ingestion	No known significant effects or critical hazards.	

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	No specific data.		
Skin contact	Adverse symptoms may include the following: irritation dryness cracking		
Inhalation	No specific data.		
Ingestion	No specific data.		

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure	
Potential immediate effects	Not available.
Potential delayed effects	Not available.
Long term exposure	
Potential immediate effects	Not available.
Potential delayed effects	Not available.
Potential chronic health effects	<u>8</u>
General	USED ENGINE OILS Combustion products resulting from the operation of internal combustion engines contaminate engine oils during use. Used engine oil may contain hazardous components which have the potential to cause skin cancer. Frequent or prolonged contact with all types and makes of used engine oil must therefore be avoided and a high standard of personal hygiene maintained.
Carcinogenicity	No known significant effects or critical hazards.
Mutagenicity	No known significant effects or critical hazards.
Teratogenicity	No known significant effects or critical hazards.
Developmental effects	No known significant effects or critical hazards.
Fertility effects	No known significant effects or critical hazards.

Numerical measures of toxicity

Acute	toxicity	v estimates

Route	ATE value
Øral	172413.8 mg/kg

Product name	Castrol Vector	n 10W-30 FA-4		Product code	469317-US06	Page: 6/9
Version 2	Date of issue	11/07/2016.	Format	US	Language	ENGLISH
				(US)		(ENGLISH)

Section 12. Ecological information

Toxicity

No testing has been performed by the manufacturer.

Persistence and degradability

Expected to be biodegradable.

Bioaccumulative potential

This product is not expected to bioaccumulate through food chains in the environment.

<u>Mobility in soil</u>	
Soil/water partition coefficient (K _{oc})	Not available.
Mobility	Spillages may penetrate the soil causing ground water contamination.
Other adverse effects	No known significant effects or critical hazards.
Other ecological information	Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

Section 13. Disposal considerations

Disposal methods The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	IMDG	ΙΑΤΑ
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-
Transport hazard class(es)	-	-	-	-
Packing group	-	-	-	-
Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

Special precautions for user Not available.

bulk according Not available.

Transport in bulk according to Annex II of MARPOL and the IBC Code

Product nameCastrol Vecton 10W-30 FA-4Version 2Date of issue 11/07/2016.

 Product code
 469317-US06
 Page: 7/9

 Format
 US
 Language
 ENGLISH

 (US)
 (ENGLISH)

Section 15. Regulatory information

U.S. Federal regulations

United States inventory (TSCA 8b)

At least one component is not listed.

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 311/312

Classification

Not applicable.

SARA 313

	Product name	CAS number	Concentration
Form R - Reporting requirements	Zinc bis[O-(6-methylheptyl)] bis[O-(sec-butyl)] bis (dithiophosphate)	93819-94-4	0.90625 - 1.45
Supplier notification	<pre>princ bis[O-(6-methylheptyl)] bis[O-(sec-butyl)] bis (dithiophosphate)</pre>	93819-94-4	0.90625 - 1.45

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

<u>State regulations</u>	
Massachusetts	The following components are listed: OIL MIST, MINERAL
New Jersey	The following components are listed: ZINC compounds; MINERAL OIL (UNTREATED and MILDLY TREATED)
Pennsylvania	The following components are listed: ZINC COMPOUNDS; MINERAL OIL MIST
California Prop. 65	WARNING: This product contains a chemical known to the State of California to cause cancer. Nickel
Other regulations	
Australia inventory (AICS)	All components are listed or exempted.
Canada inventory	All components are listed or exempted.
China inventory (IECSC)	At least one component is not listed.
Japan inventory (ENCS)	All components are listed or exempted.
Korea inventory (KECI)	All components are listed or exempted.
Philippines inventory (PICCS)	All components are listed or exempted.
Taiwan Chemical Substances Inventory (TCSI)	All components are listed or exempted.
REACH Status	For the REACH status of this product please consult your company contact, as identified in Section 1.

Section 16. Other information

National Fire Protection Association (U.S.A.)



Product name	Castrol Vecton 10W-30 FA-4		Product code	469317-US06	Page: 8/9
Version 2	Date of issue 11/07/2016.	Format	US	Language	ENGLISH
			(US)		(ENGLISH)

Section 16. Other information

Key to abbreviations	ACGIH = American Conference of Industrial Hygienists
	ATE = Acute Toxicity Estimate
	BCF = Bioconcentration Factor
	CAS Number = Chemical Abstracts Service Registry Number
	GHS = Globally Harmonized System of Classification and Labelling of Chemicals
	IATA = International Air Transport Association
	IBC = Intermediate Bulk Container
	IMDG = International Maritime Dangerous Goods
	LogPow = logarithm of the octanol/water partition coefficient
	MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as
	modified by the Protocol of 1978. ("Marpol" = marine pollution)
	OEL = Occupational Exposure Limit
	SDS = Safety Data Sheet
	STEL = Short term exposure limit
	TWA = Time weighted average
	UN = United Nations
	UN Number = United Nations Number, a four digit number assigned by the United
	Nations Committee of Experts on the Transport of Dangerous Goods.
	Varies = may contain one or more of the following 101316-69-2, 101316-70-5,
	101316-71-6, 101316-72-7, 64741-88-4, 64741-89-5, 64741-95-3, 64741-96-4,
	64741-97-5, 64742-01-4, 64742-44-5, 64742-45-6, 64742-52-5, 64742-53-6, 64742-54-7,
	64742-55-8, 64742-56-9, 64742-57-0, 64742-58-1, 64742-62-7, 64742-63-8, 64742-64-9,
	64742-65-0, 64742-70-7, 72623-85-9, 72623-86-0, 72623-87-1, 74869-22-0, 90669-74-2

Indicates information that has changed from previously issued version.

Notice to reader

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from BP Group.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken. You can contact the BP Group to ensure that this document is the most current available. Alteration of this document is strictly prohibited.



Section 1: IDENTIFICATION		
Product Name:	Propane	
Synonyms:	LPG (Liquefied Petroleum Gas); LP-Gas.	
Product Use:	Propane is commonly used as a fuel for heating, cooking, automobiles, forklift trucks, crop drying and welding and cutting operations. Propane is used in industry as a refrigerant, solvent and as a chemical feedstock.	
Restrictions on Use:	Not available.	
Manufacturer/Supplier:	Superior Propane Suite 400, 6750 Century Avenue Mississauga, ON L5N 2V8	
Phone Number:	1-877-873-7467	
Emergency Phone:	CANUTEC 1-888-CAN-UTEC (226-8832) or 613-996-6666 or *666 on a cellular phone	
Date of Preparation of SDS:	September 17, 2021	
Section 2: HAZARD(S) IDENTIFICATION		

GHS INFORMATION

Classification:	Flammable Gases, Category 1
	Gases Under Pressure - Compressed Gas
	Simple Asphyxiant, Category 1

LABEL ELEMENTS

Hazard Pictogram(s):



Signal Word: Danger

HazardExtremely flammable gas.Statements:Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.

Precautionary Statements

Prevention: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

- **Response:** Leaking gas fire: Do not extinguish unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.
 - Storage: Store in a well ventilated place.
- Disposal: Not applicable.

Hazards Not Otherwise Classified: Not applicable.

Ingredients with Unknown Toxicity: None.

This material is considered hazardous by the OSHA Hazard Communication Standard, (29 CFR 1910.1200). This material is considered hazardous by the Hazardous Products Regulations.



Propane Date of Preparation: September 17, 2021

Section 3: COMPOSITION / INFORMATION ON INGREDIENTS				
Hazardous Ingredien	t(s)	Common name / Synonyms	CAS No.	% vol./vol.
Propane		Not available.	74-98-6	90 - 99
Ethane		Not available.	74-84-0	0 - 5
1-Propene		Propylene	115-07-1	0 - 5
Butane		Not available.	106-97-8	0 - 2.5
	Secti	on 4: FIRST-AID MEASURES		
Inhalation:	Call a poison c	enter or doctor if you feel unv	well.	
E.s. Osaríasta	Acute and delay rapid suffocatio is present in co 18 % (vol). Syn drowsiness, dis death may occu irritation. Signs/ headache, hoa	n. Central nervous system de ncentrations that will reduce to nptoms may include headach corientation, vomiting and seiz ur with severe oxygen deprivat (symptoms may include coug rseness, and nose and throat	ay displace oxyg epression can occ the oxygen conte e, lightheadedne cures. Unconscio ation. May cause h, sneezing, nasa pain.	en and cause cur if product nt of air below ss, usness and respiratory al discharge,
Eye Contact:	Rinse cautious lenses, if need doctor.	ly with water for at least 15 n ed. Continue rinsing. Immedi	ninutes. Remove ately call a poiso	contact on center or
	Acute and delay liquefied gas m with liquid can result.	yed symptoms and effects: Co ay cause irritation and/or frost quickly subside. Permanent e	ontact with rapidl stbite. The pain a eye damage or bl	y expanding or fter contact lindness could
Skin Contact:	Contact with ra frostbite. If on s advice/attention affected area. I remove adhere	pidly expanding or liquefied skin: Wash with plenty of wat n. Thaw frosted parts with lul Remove non-adhering contai ent material or clothing.	gas may cause ir er. Get immediat kewarm water. D minated clothing.	rritation and/or e medical o not rub Do not
	Acute and delay or liquefied gas include change contact with liq	yed symptoms and effects: C s may cause irritation and/or in skin colour to white or gra uid can quickly subside.	ontact with rapid frostbite. Sympto ayish-yellow. The	ly expanding oms of frostbite e pain after
Ingestion:	Not a normal ro	oute of exposure.		
	Acute and delay	yed symptoms and effects: N	ot a normal route	e of exposure.
General Advice:	In case of accid (show the labe	dent or if you feel unwell, see I or SDS where possible).	k medical advice	e immediately
Note to Physicians:	Symptoms may	/ not appear immediately.		



Section 5: FIRE-FIGHTING MEASURES

FLAMMABILITY AND EXPLOSION INFORMATION

Extremely flammable gas. Contains gas under pressure; may explode if heated. Will be easily ignited by heat, sparks or flames. Will form explosive mixtures with air. Vapors from liquefied gas are initially heavier than air and spread along ground. Vapors may travel to source of ignition and flash back. Cylinders exposed to fire may vent and release flammable gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket. DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.

If a tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.

Fire involving Tanks: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Do not direct water at source of leak or safety devices; icing may occur. Withdraw immediately in case of rising sound from venting safety devices or discolouration of tank. ALWAYS stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Sensitivity to Mechanical Impact: Sensitivity to Static Discharge:	This material is not sensitive to mechanical impact. This material is sensitive to static discharge.
MEANS OF EXTINCTION Suitable Extinguishing Media:	Small Fire: Dry chemical or CO2.
	Large Fire: Water spray or fog. Move containers from fire area if you can do it without risk.
Unsuitable Extinguishing Media:	Not available.
Products of Combustion:	Oxides of carbon.
Protection of Firefighters:	Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. Vapors may cause dizziness or asphyxiation without warning. Some may be irritating if inhaled at high concentrations. Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite. Fire may produce irritating and/or toxic gases. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection. Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

Section 6: ACCIDENTAL RELEASE MEASURES

Emergency Procedures: As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). Keep out of low areas. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). All equipment used when handling the product must be grounded.



	Propane
SAFETY DATA SHEET	Date of Preparation: September 17, 2021
Personal Precautions:	Do not touch or walk through spilled material. Use personal protection recommended in Section 8.
Environmental Precautions:	Not normally required.
Methods for Containment:	Stop leak if you can do it without risk. If possible, turn leaking containers so that gas escapes rather than liquid. Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. Do not direct water at spill or source of leak.
Methods for Clean-Up:	Prevent spreading of vapors through sewers, ventilation systems and confined areas. Isolate area until gas has dispersed. CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.
Other Information:	See Section 13 for disposal considerations.

Section 7: HANDLING AND STORAGE

Handling:

Avoid breathing gas. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Pressurized container: Do not pierce or burn, even after use. See Section 8 for information on Personal Protective Equipment.

Storage:

Store in a well-ventilated place. Store away from incompatible materials. See Section 10 for information on Incompatible Materials. Keep out of the reach of children.

Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines Component

Propane [CAS No. 74-98-6]

ACGIH: Simple asphyxiant; Explosion hazard **OSHA:** 1000 ppm (TWA), 1800 mg/m³ (TWA);

Ethane [CAS No. 74-84-0]

ACGIH: Simple asphyxiant; Explosion hazard **OSHA:** No PEL established.

Propylene [CAS No. 115-07-1] ACGIH: 500 ppm (TWA); A4 (2005) OSHA: No PEL established.

Butane [CAS No. 106-97-8]

ACGIH: 1000 ppm (STEL); Explosion hazard (2012) OSHA: 800 ppm (TWA) [Vacated];

PEL: Permissible Exposure Limit **TWA:** Time-Weighted Average **C:** Ceiling



Propane Date of Preparation: September 17, 2021

Engineering Controls:

Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapour, gas, etc.) below recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT (PPE)



Eye/Face Protection:	Wear safety glasses. Use equipment for eye protection that meets the standards referenced by CSA Standard CAN/CSA-Z94.3 and OSHA regulations in 29 CFR 1910.133 for Personal Protective Equipment.
Hand Protection:	Wear insulated neoprene gloves. Consult manufacturer specifications for further information.
Skin and Body Prote	ction: Wear protective clothing.
Respiratory Protection	If engineering controls and ventilation are not sufficient to control exposure to below the allowable limits then an appropriate NIOSH/MSHA approved air-purifying respirator that meets the requirements of CSA Standard CAN/CSA-Z94.4, or self- contained breathing apparatus must be used. Supplied air breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air- purifying respirators.
General Hygiene Considerations:	Handle according to established industrial hygiene and safety practices. Consult a competent industrial hygienist to determine hazard potential and/or the PPE manufacturers to ensure adequate protection

Section 9: PHYSICAL AND CHEMICAL PROPERTIES		
Appearance:	Liquefied gas.	
Colour:	Colourless.	
Odour:	Odourless, unless odourized with ethyl mercaptan (skunky odour, similar to boiling cabbage).	
Odour Threshold:	4800 ppm	
Physical State:	Gas.	
pH:	Not available.	
Melting Point / Freezing Point:	-188 °C (-306.4 °F)	
Initial Boiling Point:	-42.2 °C (-44 °F)	
Boiling Point:	-42 °C (-43.6 °F)	
Flash Point:	-103.4 °C (-154.1 °F) (Closed Cup)	
Evaporation Rate:	Rapid.	
Flammability (solid, gas):	Extremely flammable gas.	



Propane Date of Preparation: September 17, 2021

SAFETY DATA SHEET	Date of Preparation
Lower Flammability Limit:	2.1%
Upper Flammability Limit:	9.5%
Vapor Pressure:	1435 kPa (maximum) at 37.8 °C (100 °F)
Vapor Density:	1.52 (Air = 1)
Relative Density:	0.51 (Water = 1)
Solubilities:	Slight, 6.1% by volume @ 17.8°C (64 °F)
Partition Coefficient: n- Octanol/Water:	Not available.
Auto-ignition Temperature:	432 °C (809.6 °F)
Decomposition Temperature:	Not available.
Viscosity:	Not available.
Percent Volatile, wt. %:	Not available.
VOC content, wt. %:	Not available.
Density:	Not available.
Coefficient of Water/Oil Distribution:	Not available.

Section 10: STABILITY AND REACTIVITY

Reactivity:	Contact with incompatible materials. Sources of ignition. Exposure to heat.
Chemical Stability:	Stable under normal storage conditions.
Possibility of Hazardous Reactions:	Gas explodes spontaneously when mixed with chloride dioxide.
Conditions to Avoid:	Contact with incompatible materials. Sources of ignition. Exposure to heat.
Incompatible Materials:	Oxidizers. Chlorine dioxide.
Hazardous Decomposition Products:	Carbon dioxide. Carbon monoxide.

Section 11: TOXICOLOGICAL INFORMATION

EFFECTS OF ACUTE EXPOSURE Product Toxicity

Oral:	Not available.
Ural.	not available.

Dermal: Not available.

Inhalation: Not available.



Component Toxicity

Component	CAS No.	LD ₅₀ oral	LD50 dermal	LC50
Propane	74-98-6	Not available.	Not available.	Not available.
Ethane	74-84-0	Not available.	Not available.	Not available.
Propylene	115-07-1	Not available.	Not available.	86000 mg/m³ (rat); 4H
Butane	106-97-8	Not available.	Not available.	658000 mg/m³ (rat); 4H

Likely Routes of Exposure: Eye contact. Skin contact. Inhalation.

 Target Organs:
 Skin. Eyes. Respiratory system. Central nervous system.

Symptoms (including delayed and immediate effects)

Inhalation:

May displace oxygen and cause rapid suffocation. Central nervous system depression can occur if product is present in concentrations that will reduce the oxygen content of air below 18 % (vol). Symptoms may include headache, lightheadedness, drowsiness, disorientation, vomiting and seizures. Unconsciousness and death may occur with severe oxygen deprivation. May cause respiratory irritation. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

- **Eye:** Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. The pain after contact with liquid can quickly subside. Permanent eye damage or blindness could result.
- **Skin:** Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. Symptoms of frostbite include change in skin colour to white or grayish-yellow. The pain after contact with liquid can quickly subside.
- **Ingestion:** Not a normal route of exposure.

Skin Sensitization:	Not available.
Respiratory Sensitization:	Not available.
Medical Conditions Aggravated By Exposure:	Not available.

EFFECTS OF CHRONIC E	XPOSURE (from	n short and lo	ong-term expos	ure)	
Target Organs:	Skin. Eyes. Res	spiratory sys	tem. Central ne	ervous system.	
Chronic Effects:	Not available.				
Carcinogenicity:	Product is not c Carcinogenicity	lassified as to table below	a carcinogen. S for information	See Componer	nt components.
Component Carcinogenicity					
Component	ACGIH	IARC	NTP	OSHA	Prop 65
Propylene	A4	Group 3	Not listed.	Not listed.	Not listed.
Mutagenicity:	Not available.				

Reproductive Effects: Not available.



Developmental Effects

Teratogenicity: Not available.

Embryotoxicity: Not available.

Toxicologically Synergistic Materials: Not available.

	Section 12: ECOLOGICAL INFORMATION
Ecotoxicity:	Not available.
Persistence / Degradabil	ity: Not available.
Bioaccumulation / Accur	nulation: Not available.
Mobility in Environment:	Not available.
Other Adverse Effects:	Not available.
	Section 13: DISPOSAL CONSIDERATIONS
Disposal Instructions:	Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.
	Section 14: TRANSPORT INFORMATION
U.S. Department of Trans Proper Shipping Name:	sportation (DOT) <u>UN1075</u> , LIQUEFIED PETROLEUM GASES, 2.1
Class:	2.1
UN Number:	UN1075
Packing Group:	Not applicable.
Label Code:	FLAMMABLE GAS 2
Canada Transportation o	f Dangerous Goods (TDG)
Proper Shipping Name:	UN1075, LIQUEFIED PETROLEUM GASES, 2.1
Class:	2.1
UN Number:	UN1075
Packing Group:	Not applicable.
Label Code:	

Section 15: REGULATORY INFORMATION

Chemical Inventories

US (TSCA)

The components of this product are in compliance with the chemical notification requirements of TSCA.



Canada (DSL)

The components of this product are in compliance with the chemical notification requirements of the NSN Regulations under CEPA, 1999.

Federal Regulations

United States

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SARA Title III

Component	Section 302 (EHS) TPQ (lbs.)	Section 304 EHS RQ (Ibs.)	CERCLA RQ (lbs.)	Section 313	RCRA CODE	CAA 112(r) TQ (lbs.)
Propane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
Ethane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
Propylene	Not listed.	Not listed.	Not listed.	313	Not listed.	10000
Butane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000

State Regulations Massachusetts

US Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

CAS No.	RTK List
74-98-6	Listed.
74-84-0	Listed.
115-07-1	Listed.
106-97-8	Listed.
	CAS No. 74-98-6 74-84-0 115-07-1 106-97-8

New Jersey

US New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

Component	CAS No.	RTK List
Propane	74-98-6	SHHS
Ethane	74-84-0	SHHS
Propylene	115-07-1	SHHS
Butane	106-97-8	SHHS

Note: SHHS = Special Health Hazard Substance

Pennsylvania

US Pennsylvania Worker and Community Righ	nt-to-Know Law (34 Pa. Code Chap	. 301-323)
Component	CAS No.	RTK List
Propane	74-98-6	Listed.
Ethane	74-84-0	Listed.
Propylene	115-07-1	Е
Butane	106-97-8	Listed.
Note: E = Environmental Hazard		

California Prop 65: This product does not contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.



Section 16: OTHER INFORMATION

Disclaimer:

The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for their own particular use.

Date of Preparation of SDS:	September 17, 2021
Version:	2.0
<u>GHS SDS</u> Prepared by:	Deerfoot Consulting Inc.
	Phone: (403) 720-3700



Universal Antifreeze SDS Preparation Date (mm/dd/yyyy): 08/31/2016

Page 1 of 10

SAFETY DATA SHEET

SECTION 1. IDENTIFICATION

Product identifier used on the label			
	: Universal Antifreeze		
Product Code(s)	: Not available.		
Recommended use of the che	emical and restrictions on use		
	: Antifreeze Use pattern: Professional Use O Restriction on use: None known	nly	
Chemical family	: Glycols .		
Name, address, and teleph of the supplier:	none number	Name, address, and telephone number of the manufacturer:	
Comet Chemical Company	/ Ltd.	Refer to supplier	
3463 Thomas Street Innisfill, ON, Canada L9S 3W4			
Supplier's Telephone #	: 705-436-5580		
24 Hr. Emergency Tel #	: TERRRAPURE ENVIRONMENT	TAL : 800-567-7455	

SECTION 2. HAZARDS IDENTIFICATION

Classification of the chemical

Clear colourless liquid. Odorless.

This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015).

Hazard classification:

Acute toxicity, oral - Category 4 Reproductive toxicity- Category 2 Specific target organ toxicity, single exposure - Category 2 (kidneys) Specific Target Organ Toxicity, Single Exposure - Category 3 narcotic effects

Label elements

Hazard pictogram(s)



Signal Word

Warning!

Hazard statement(s)

Harmful if swallowed. Suspected of damaging the unborn child. May cause damage to the kidneys if swallowed. May cause drowsiness or dizziness.



Universal Antifreeze SDS Preparation Date (mm/dd/yyyy): 08/31/2016

Page 2 of 10

SAFETY DATA SHEET

Precautionary statement(s)

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Do not breathe mist or vapor. Wear protective gloves/clothing and eye/face protection. If exposed or concerned: Call a POISON CENTER or doctor/physician.

IF SWALLOWED: Call a POISON CENTRE or doctor/physician if you feel unwell. Rinse mouth. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

Store locked up. Store in a well-ventilated place. Keep container tightly closed.

Dispose of contents/container in accordance with local/regional/national/international regulations.

Other hazards

Other hazards which do not result in classification: May cause eye, skin and respiratory tract irritation.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance

Ethylene glycol 1,2-Ethanediol 107-21-1 100.00	Chemical name	Common name and synonyms	<u>CAS #</u>	Concentration (% by weight)
	Ethylene glycol	1,2-Ethanediol 1,2-Dihydroxyethane EG	107-21-1	100.00

SECTION 4. FIRST-AID MEASURES

Description of first aid measures

Ingestion	 Call a physician or poison control centre immediately. Induce vomiting ONLY under the direct supervision of qualified medical personnel or a poison control centre. Never give anything by mouth to an unconscious person.
Inhalation	 Immediately remove person to fresh air. If breathing has stopped, give artificial respiration. Get medical attention if symptoms persist.
Skin contact	: Immediately flush with plenty of water, while removing contaminated clothing. If irritation persists, seek prompt medical attention. Launder clothing before reuse.
Eye contact	: Immediately flush eye(s) with plenty of water. After initial flushing, remove any contact lenses if worn, and continue flushing for at least 5 to 10 minutes. If irritation persists, seek prompt medical attention.
Most important sympto	oms and effects, both acute and delayed
	: Harmful if swallowed. May cause damage to the kidneys if swallowed. May cause drowsiness or dizziness. Symptoms may include pain, headache, nausea, vomiting, dizziness, drowsiness and other central nervous system effects. May cause slight eye and skin irritation. Symptoms include: Redness, swelling, itching and dryness.

Suspected of damaging the unborn child.



Universal Antifreeze

SDS Preparation Date (mm/dd/yyyy): 08/31/2016

Page 3 of 10

SAFETY DATA SHEET

Indication of any immediate medical attention and special treatment needed

: Immediate medical attention is required. May be harmful or fatal if swallowed. Use of ethanol may be helpful to counter the toxic effects of ethylene glycol by interfering with the absorption rate in the stomach and intestine. Onset of symptoms may be delayed for 18 to 24 hours after ingestion. Symptoms may be delayed.

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media

: Use media suitable to the surrounding fire such as water fog or fine spray, alcohol foams, carbon dioxide and dry chemical.

Unsuitable extinguishing media

: Do not use a solid water stream as it may scatter and spread fire.

Special hazards arising from the substance or mixture / Conditions of flammability

: Burning produces obnoxious and toxic fumes.

Flammability classification (OSHA 29 CFR 1910.106)

: Not flammable.

Hazardous combustion products

: Carbon oxides, formaldehyde and other irritating fumes and smoke.

Special protective equipment and precautions for firefighters

Protective equipment for fire-fighters

: Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

Special fire-fighting procedures

: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode. Move containers from fire area if safe to do so. Water spray may be useful in cooling equipment exposed to heat and flame.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Environmental precautions	 Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. All persons dealing with clean-up should wear the appropriate protective equipment including self-contained breathing apparatus. Refer to Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION, for additional information on acceptable personal protective equipment. Ensure spilled product does not enter drains, sewers, waterways, or confined spaces. If necessary, dike well ahead of the spill to prevent runoff into drains, sewers, or any natural waterway or drinking supply.
Methods and material for co	ntainment and cleaning up
	: Ventilate the area. Stop spill or leak at source if safely possible. Dike for water control. Contain and absorb spilled liquid with non-combustible, inert absorbent material (e.g. sand), then place absorbent material into a container for later disposal (see Section 13).
Special spill response proce	dures
	In case of transportation accident, contact TERRAPURE ENVIRONMENTAL at 1-800-567-7455.

US CERCLA Reportable quantity (RQ): Ethylene glycol (5000 lbs / 2270 kg).

SECTION 7. HANDLING AND STORAGE

Precautions for safe handling



Universal Antifreeze

SDS Preparation Date (mm/dd/yyyy): 08/31/2016

Page 4 of 10

SAFETY DATA SHEET

	:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. This material is a harmful liquid. Wear protective gloves/clothing and eye/face protection. Use with adequate ventilation. Do not ingest. Do not breathe mist or vapor. Avoid contact with eyes, skin and clothing. Wash with soap and water after handling. Keep away from extreme heat and flame. Keep away from acids and other incompatibles. Use caution when opening cap. Keep containers tightly closed when not in use. Empty containers retain residue (liquid and/or vapour) and can be dangerous.
Conditions for safe storage	:	Store in a cool, dry, well-ventilated area. Store away from areas of excessive heat, open flames, sparks, and other possible sources of ignition. Keep away from incompatibles. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks.
Incompatible materials	:	Alkalies ;Strong oxidizing agents;Strong acids.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits:				
Chemical Name	ACGIH TLV		OSHA PEL	
	TWA	<u>STEL</u>	PEL	<u>STEL</u>
Ethylene glycol	100 mg/m³ (aerosol) (Ceiling)	N/A∨	50 ppm (final rule limit)	N/A∨

Exposure controls

Ventilation and engineering measures

Respiratory protection	 Use sufficient mechanical ventilation to maintain exposures below the TLV. Use local exhaust if mist or spray is generated. Respiratory protection is required if the concentrations exceed the TLV. NIOSH-approved respirators are recommended. Seek advice from respiratory protection specialists. Respirators should be selected based on the form and concentration of contaminants in air, and in accordance with OSHA (29 CFR 1910.134) or CSA Z94.4-02.
Skin protection	: Wear impervious gloves, such as butyl rubber. Advice should be sought from glove suppliers.
Eye / face protection	: Chemical goggles are recommended when there is a potential for splashing.
Other protective equipment	: Emergency showers and eyewash facilities should be nearby. Wear a chemically resistant apron and long sleeves when dispensing, to prevent skin contact.
General hygiene consideration	ns
	: Do not breathe mist or vapor. Avoid contact with eyes, skin and clothing. When using do not eat or drink. When using do not smoke. Upon completion of work, wash hands before eating, drinking, smoking or use of toilet facilities. Remove soiled clothing and wash it thoroughly before reuse.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

:	Clear, colourless liquid.					
:	Little or no odour.					
:	N/Av					
:	N/Av					
:	- 13°C (8.6°F)					
Initial boiling point and boiling range						
	: : : :					

: 198°C (388°F)



Universal Antifreeze SDS Preparation Date (mm/dd/yyyy): 08/31/2016

Page 5 of 10

SAFETY DATA SHEET

Flash point	: 111°C (232°F)
Flashpoint (Method)	: closed cup
Evaporation rate (BuAe = 1)	: N/Av
Flammability (solid, gas)	: Not applicable.
Lower flammable limit (% by	vol.)
	: 3.2%
Upper flammable limit (% by	vol.)
	: 15.0%
Oxidizing properties	: None known.
Explosive properties	: Not explosive
Vapour pressure	: 0.05
Vapour density	: 2.1
Relative density / Specific gr	avity
	: 1.12
Solubility in water	: Complete
Other solubility(ies)	: Soluble in most organic solvents.
Partition coefficient: n-octan	ol/water or Coefficient of water/oil distribution
	: -1.36
Auto-ignition temperature	: 398°C (748°F)
Decomposition temperature	: Not available.
Viscosity	: 21 cp @ 20°C (68°F)
Volatiles (% by weight)	: No information available.
Volatile organic Compounds	(VOC's)
	: N/Av
Absolute pressure of contain	ier
	: N/Ap
Flame projection length	: N/Ap
Other physical/chemical con	iments
	: None known or reported by the manufacturer.
SECTION 10. STABILITY	AND REACTIVITY
Reactivity	: Not normally reactive.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous read	tions
	No dangerous reaction known under conditions of normal use.
Conditions to avoid	: Avoid excessive heat, sparks and open flame. Do not use in areas without adequate ventilation. Avoid contact with incompatible materials.
Incompatible materials	: Strong oxidizing agents; Strong acids; Strong alkalis.
Hazardous decomposition p	roducts
	: None known, refer to hazardous combustion products in Section 5.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure:

Routes of entry inhalation	:	YES			
Routes of entry skin & eye	:	YES			
Routes of entry Ingestion	:	YES			
Routes of exposure skin absorption					



Universal Antifreeze SDS Preparation Date (mm/dd/yyyy): 08/31/2016

Page 6 of 10

SAFETY DATA SHEET

Potential Health Effects:

Signs and symptoms of short-term (acute) exposure

Sign and symptoms Inhalation

	:	If mists are inhaled, may cause tearing, general anesthesia, headache, coughing, respiratory stimulation, nausea, vomiting, pulmonary, kidney and liver damage.
Sign and symptoms ingestic	n	
	:	Harmful or fatal if swallowed. Human poison by ingestion (lethal dose of Ethylene glycol for humans reported to be 100 mL). Symptoms may include pain, headache, nausea, vomiting, dizziness, drowsiness and other central nervous system effects. Initially, the central nervous system is stimulated, followed by depression. Could cause cyanosis (bluish discoloration of the skin due to deficient oxygenation of the blood). May potentially result in lethal kidney damage. Could also cause convulsions, coma, respiratory arrest and death.
Sign and symptoms skin	:	May cause mild skin irritation. Product may be absorbed and cause symptoms similar to those listed for ingestion.
Sign and symptoms eyes	:	May cause mild eye irritation. Symptoms may include inflammation and tearing.
Potential Chronic Health Eff	ects	3
	:	Prolonged or repeated ingestion may cause bladder or kidney stones.
Mutagenicity	:	Not expected to be mutagenic.
Carcinogenicity	:	No components are listed as carcinogens by ACGIH, IARC, OSHA or NTP.
Reproductive effects & Tera	tog	enicity
Sensitization to material	:	This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification: Reproductive toxicity -Category 2 Suspected of damaging the unborn child. Not expected to be a skin or respiratory sensitizer.
Specific target organ effects	:	Eyes, skin, respiratory system, central nervous system, liver and kidneys. This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification: Specific target organ toxicity, single exposure-Category 2 Specific Target Organ Toxicity, Single Exposure - Category 3 narcotic effects May cause damage to the kidneys if swallowed. May cause drowsiness or dizziness.
Medical conditions addravat	ha	Not classified as specific target organ toxicity-repeated exposure.
meancai conultions ayyidval	·eu	Dre-existing skin or eve disorders, and impaired liver or kidney functions
Synoraistic matorials	:	Not available
Toxicological data	÷	Not available.
i uxiculugical uata		See below for toxicological data on the substance.

	LC50(4hr)	LD ₅₀)
Chemical name	<u>inh, rat</u>	<u>(Oral, rat)</u>	<u>(Rabbit, dermal)</u>
Ethylene glycol	4300 ppm (10.92 mg/L) (aerosol)	4000 mg/kg (rat) The estimated human lethal dose is: 1110 - 1665 mg/kg	9530 mg/kg

Other important toxicological hazards

: CNS depression may result from extreme exposures.



Universal Antifreeze SDS Preparation Date (mm/dd/yyyy): 08/31/2016

Page 7 of 10

SAFETY DATA SHEET

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

: See the following tables for individual ingredient ecotoxicity data.

Ecotoxicity data:

<u>Ingredients</u>	CAS No	Toxicity to Fish			
		LC50 / 96h	NOEC / 21 day	M Factor	
Ethylene glycol	107-21-1	22 810 mg/L (Rainbow trout	N/Av	None.	

Ingredients	CAS No	Toxicity to Daphnia		
		EC50 / 48h	NOEC / 21 day	M Factor
Ethylene glycol	107-21-1	49 000 mg/L (Daphnia magna)	7500 - 15 000 mg/L	None.

Ingredients	CAS No	Toxicity to Algae		
		EC50 / 96h or 72h	NOEC / 96h or 72h	M Factor
Ethylene glycol	107-21-1	6500 - 13 000 mg/L/96hr (Green algae)	10 000 mg/L/96hr	None.

Persistence and degradability

: Ethylene glycol is considered to be readily biodegradable.

Bioaccumulation potential : No data is available on the product itself.

<u>Components</u>		Partition coefficient n-octanol/water (log Kow)	Bioconcentration factor (BCF)
Ethylene glycol (CAS	107-21-1)	- 1.36	10
Mobility in soil	:	No data is available on the product itself.	

Other Adverse Environmental effects

: No data is available on the product itself.

SECTION 13. DISPOSAL CONSIDERATIONS

Handling for Disposal	:	Handle waste according to recommendations in Section 7.
Methods of Disposal	:	Dispose in accordance with all applicable federal, state, provincial and local regulations.
RCRA	:	If this product, as supplied, becomes a waste in the United States, it may meet the criteria of a hazardous waste as defined under RCRA, Title 40 CFR 261. It is the responsibility of the waste generator to determine the proper waste identification and disposal method. For disposal of unused or waste material, check with local, state and federal environmental agencies.


Universal Antifreeze SDS Preparation Date (mm/dd/yyyy): 08/31/2016

Page 8 of 10

SAFETY DATA SHEET

SECTION 14. TRANSPORTATION INFORMATION

Regulatory Information	UN Number	UN proper shipping name	Transport hazard class(es)	Packing Group	Label	
49CFR/DOT	None	Not regulated.	Not regulated	none	\bigotimes	
49CFR/DOT Additional information	If the quantity of applies: RQ UN3082, E	f Ethylene glycol is greater than 5000 pounds per containe nvironmentally hazardous substances, liquid, n.o.s. (Ethyle	er, the following	DOT shipp	ing description	
TDG	None	Not regulated.	Not regulated	none	\bigotimes	
TDG Additional information	TDG None. Additional information					
Special preca	utions for use	r : None known or reported by the manufacturer.				
Environmental hazards : This product does not meet the criteria for an environmentally hazardous mixture, according to the IMDG Code. See ECOLOGICAL INFORMATION, Section 12.						

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

: Not available.

SECTION 15 - REGULATORY INFORMATION

US Federal Information:

Components listed below are present on the following U.S. Federal chemical lists:

	TSCA		CERCLA	SARA TITLE III: Sec. 302, Extremely	SARA TITLE III: Sec. 313, 40 CFR 372, Specific Toxic Chemical		
<u>Ingredients</u>	CAS # Inventory	Inventory	Quantity(RQ) (40 CFR 117.302):	Hazardous Substance, 40 CFR 355:	Toxic Chemical	de minimus Concentration	
Ethylene glycol	107-21-1	Yes	5000 lb/ 2270 kg	None.	Yes	1%	

SARA TITLE III: Sec. 311 and 312, SDS Requirements, 40 CFR 370 Hazard Classes: Immediate (Acute) health hazard; Chronic health hazard. Under SARA Sections 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are 500 pounds for the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

US State Right to Know Laws:

The following chemicals are specifically listed by individual States:

Ingredients	CAS #	California Proposition 65		State "Right to Know" Lists					
<u></u>		Listed	Type of Toxicity	Y CA MA MN NJ				PA	RI
Ethylene glycol	107-21-1	No	N/Ap	Yes	Yes	Yes	Yes	Yes	Yes



Comet Chemical Company Ltd. 3463 Thomas Street Innisfill, ON, Canada, L9S 3W4 Telephone: (705) 436 5580

Universal Antifreeze

SDS Preparation Date (mm/dd/yyyy): 08/31/2016

Page 9 of 10

SAFETY DATA SHEET

WHMIS Classification: Refer to Section 2 for a WHMIS Classification for this product. All ingredients are present on the DSL.

International Information:

Components listed below are present on the following International Inventory list:

Ingredients	CAS #	European EINECs	Australia AICS	Philippines PICCS	Japan ENCS	Korea KECI/KECL	China IECSC	NewZealand IOC
Ethylene glycol	107-21-1	203-473-3	Present	Present	(2)-230	KE-13169	Present	HSR001534

SECTION 16. OTHER INFORMATION

Legend	: ACGIH: American Conference of Governmental Industrial Hygienists CA: California CAS: Chemical Abstract Services CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980 CFR: Code of Federal Regulations CNS: Central Nervous System COC: Cleveland Open Cup CSA: Canadian Standards Association DOT: Department of Transportation EPA: Environmental Protection Agency
	HMIS: Hazardous Materials Identification System
	HSDB: Hazardous Substances Data Bank
	IARC: International Agency for Research on Cancer
	Inn. Innalation
	LD: Lethal Dose
	MA ⁻ Massachusetts
	MN: Minnesota
	N/Ap: Not Applicable
	N/Av: Not Available
	NFPA: National Fire Protection Association
	NIOSH: National Institute of Occupational Safety and Health
	NJ: New Jersey
	NTP: National Toxicology Program
	OSHA: Occupational Safety and Health Administration
	PA: Pennsylvania
	PEL: Permissible exposure limit
	RCRA: Resource Conservation and Recovery Act
	RI: Rhode Island
	RIECS: Registry of Toxic Effects of Chemical Substances
	SARA: Superiund Amendments and Reauthonzation Act
	STEL. SHORT FERRE EXPOSURE LITHIN
	TWA: Time Weighted Average
	WHMIS: Workplace Hazardous Materials Identification System



Comet Chemical Company Ltd. 3463 Thomas Street Innisfill, ON, Canada, L9S 3W4 Telephone: (705) 436 5580

Universal Antifreeze

SDS Preparation Date (mm/dd/yyyy): 08/31/2016

Page 10 of 10

SAFETY DATA SHEET

References

: 1. ACGIH, Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices for 2016

2. International Agency for Research on Cancer Monographs, searched 2016

- 3. Canadian Centre for Occupational Health and Safety, CCInfoWeb databases,
- 2016(Chempendium, HSDB and RTECs).

4. Material Safety Data Sheets from manufacturer.

5. US EPA Title III List of Lists - 2016 version.

6. California Proposition 65 List - 2016 version.

7. OECD - The Global Portal to Information on Chemical Substances -

eChemPortal,2016.

Preparation Date (mm/dd/yyyy)

: 08/31/2016

Other special considerations for handling

: Provide adequate information, instruction and training for operators.

Prepared for:

Comet Chemical Company Ltd. 3463 Thomas Street Innisfill, ON L9S 3W4 Information (M-F 8:00-5:00): 705-436-5580 www.cometchemical.com

Prepared by:

ICC The Compliance Center Inc. Telephone: (888) 442-9628 (U.S.): (888) 977-4834 (Canada) http://www.thecompliancecenter.com



DISCLAIMER

This Safety Data Sheet was prepared by ICC The Compliance Center Inc using information provided by / obtained from Comet Chemical Company Ltd.. and CCOHS' Web Information Service. The information in the Safety Data Sheet is offered for your consideration and guidance when exposed to this product. ICC The Compliance Center Inc and Comet Chemical Company Ltd. expressly disclaim all expressed or implied warranties and assume no responsibilities for the accuracy or completeness of the data contained herein. The data in this SDS does not apply to use with any other product or in any other process.

This Safety Data Sheet may not be changed, or altered in any way without the expressed knowledge and permission of ICC The Compliance Center Inc and Comet Chemical Company Ltd.

END OF DOCUMENT



Date of the latest revision of the safety data sheet:12-08-2019Supercedes:24-07-2019

KLONDIKE ATF Universal Full Synthetic Transmission Fluid

1 Identification	
Product Identifier: Stock Number:	KLONDIKE ATF Universal Full Synthetic Transmission Fluid
Synonyms:	No data available
Recommended use and restrictions on use	
Recommended use:	Automatic Transmission Fluid
Restrictions on use:	Uses other than those described above
Initial Supplier Identifier:	KLONDIKE Lubricants Corporation
	3078 275th Street
	Langley, BC, V4W 3L4
	Canada
Tel No.:	General information 1-877-293-4691
Email:	info@klondikelubricants.com
Emergency telephone number and any	Chemtrec (Within US) 1-800-424-9300 Chemtrec
restrictions on the use of that number,	(International) 1-703-527-3887
if applicable:	
2 Hazard identification	
Classification of the hazardous product:	

Not classified under GHS

classified

Hazard statements:Not applicableOther hazards known to the supplier withrespect to the hazardous product:Physical hazards not otherwiseNone known.

Health hazards not otherwise classified None known.

3 Composition/information on ingredients

Chemical Name	Common name and synonyms	CAS registry number and any unique identifiers	Concentration
Petroleum distillates, hydrotreated heavy paraffinic	No data available	64742-54-7	1 - 5
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	No data available	72623-86-0	1 - 5



Date of the latest revision of the safety data sheet: 12-08-2019 Supercedes: 24-07-2019

Methacrylate copolymer	No data available	Confidential	1 - 5
Petroleum distillates, hydrotreated light paraffinic	No data available	64742-55-8	1 - 5
Lubricating oils (petroleum), C20-50, hydrotreated neutral oil-based	No data available	72623-87-1	80 - 100

4 First-aid measures	
Inhalation:	Remove to fresh air. If breathing is difficult, have a trained individual administer oxygen.
Eye contact:	None expected to be needed, however, use an eye wash to remove a chemical from your eye regardless of the level of hazard.
Skin Contact:	Wash with soap and water. Get medical attention if irritation develops or persists.
Ingestion:	Minimal risk of harm if swallowed. Do not induce vomiting. Seek medical attention immediately. Provide medical care provider with this SDS.
The most important symptoms and effects, whether acute or delayed:	None known.
An indication of immediate medical attention and special treatment needed, if necessary:	Treat symptomatically.

5 Fire-fighting measures	
Suitable extinguishing media: Unsuitable extinguishing media:	Use alcohol resistant foam, carbon dioxide, or dry chemical when fighting fires. Water or foam may cause frothing if liquid is burning but it still may be a useful extinguishing agent if carefully applied to the surface of the fire. Do not direct a stream of water into the hot burning liquid. No data available
Specific hazards arising from the hazardous product, such as the nature of any hazardous combustion:	Material may be ignited only if preheated to temperatures above the high flash point, for example in a fire.
Hazardous Compustion Products:	Carbon dioxide, Carbon monoxide
Special protective equipment and precautions for firefighters:	Do not enter fire area without proper protection including self- contained breathing apparatus and full protective equipment. Use methods for the surrounding fire.
6 Accidental release measures	
Personal precautions, protective	No health affects expected from the clean up of this material if contact

equipment and emergency procedures: can be avoided. Follow personal protective equipment recommendations



Date of the latest revision of the safety data sheet:12-08-2019Supercedes:24-07-2019

found in Section 8 of this SDS. Methods and materials for containment Prevent the spread of any spill

Prevent the spread of any spill to minimize harm to human health and the environment if safe to do so. Wear complete and proper personal protective equipment following the recommendation of Section 8 at a minimum. Dike with suitable absorbent material like granulated clay. Dispose of according to Federal, State, Local, or Provincial regulations. Used fluid should be disposed of at a recycling center.

7 Handling and storage

and cleaning up:

Precautions for safe handling: Conditions for safe storage: Materials to Avoid/Chemical Incompatibility: Mildly irritating material. Avoid unnecessary exposure. Store in a cool dry place. Isolate from incompatible materials. Strong oxidizing agents

8 Exposure controls/personal protection

Control parameters, including occupational exposure limit values or biological limit values and the source of those values:

Canada – Alberta – Occupational Exposure Limits:

Chemical Name	Occupational	Occupational	Occupational
	Exposure Limits -	Exposure Limits -	Exposure Limits -
	TWAs	STELs	Ceiling
No data available			

Canada – British Columbia– Occupational Exposure Limits:

Chemical Name	Occupational	Occupational	Occupational
	Exposure Limits -	Exposure Limits -	Exposure Limits -
	TWAs	STELs	Ceiling
No data available			

Canada – Manitoba – Occupational Exposure Limits:

Chemical Name	Occupational	Occupational	Occupational
	Exposure Limits -	Exposure Limits -	Exposure Limits -
	TWAs	STELs	Ceiling
No data available			

Canada – New Brunswick – Occupational Exposure Limits:

	Occupational	Occupational	Occupational
Chemical Name	Exposure Limits -	Exposure Limits -	Exposure Limits -
	TWAs	STELS	Ceiling
No data available			



Date of the latest revision of the safety data sheet:12-08-2019Supercedes:24-07-2019

Canada – Newfoundland & Labrador – Occupational Exposure Limits:

	Occupational	Occupational	Occupational
Chemical Name	Exposure Limits -	Exposure Limits -	Exposure Limits -
	TWAs	STELs	Ceiling
No data available			
Canada – Northwest Territories – Oco	cupational Exposure Limits	:	
	Occupational	Occupational	Occupational
Chemical Name	Exposure Limits -	Exposure Limits -	Exposure Limits -
	TWAs	STELs	Ceiling
No data available			

Canada – Nova Scotia – Occupational Exposure Limits:

Chemical Name	Occupational	Occupational	Occupational
	Exposure Limits -	Exposure Limits -	Exposure Limits -
	TWAs	STELs	Ceiling
No data available			

Canada – Nunavut – Occupational Exposure Limits:

Chemical Name	Occupational	Occupational	Occupational
	Exposure Limits -	Exposure Limits -	Exposure Limits -
	TWAs	STELs	Ceiling
No data available			

Canada – Ontario – Occupational Exposure Limits:

Chemical Name	Occupational	Occupational	Occupational
	Exposure Limits -	Exposure Limits -	Exposure Limits -
	TWAs	STELs	Ceiling
No data available			

Canada – Prince Edward Island – Occupational Exposure Limits:

Chemical Name	Occupational Exposure Limits -	Occupational Exposure Limits -	Occupational Exposure Limits -
	TWAs	STELs	Ceiling
No data available			

Canada – Quebec – Occupational Exposure Limits:

Chemical Name	Occupational	Occupational	Occupational
	Exposure Limits -	Exposure Limits -	Exposure Limits -
	TWAEVs	STEVs	Ceiling
No data available			

Canada – Saskatchewan – Occupational Exposure Limits:

Chemical Name	Occupational	Occupational	Occupational
---------------	--------------	--------------	--------------



	Exposure Limits -	Exposure Limits -	Exposure Limits -
	TWAs	STELs	Ceiling
No data available			

Canada - Yukon – Occupational Exposure Limits:

Chemical Name	Occupational	Occupational	Occupational
	Exposure Limits -	Exposure Limits -	Exposure Limits -
	TWAs	STELs	Ceiling
No data available			

Chemical Name	OSHA PEL	ACGIH TLV-TWA	ACGIH STEL	IDLH
No data available				

Appropriate engineering controls:

Use local exhaust ventilation or other engineering controls to minimize exposures and maintain operator comfort.

Individual protection measures, such as personal protective equipment:

Respiratory Protection:	Respiratory protection may be required to avoid overexposure when handling this product. General or local exhaust ventilation is the preferred means of protection. Use a respirator if general room ventilation is not available or sufficient to eliminate symptoms.
Respirator Type(s):	None required where adequate ventilation is provided. If airborne
	concentrations are above the applicable exposure limits, use
	NIOSH/MSHA approved respiratory protection.
Eye and face protection:	No special requirements under normal industrial use.
Skin Protection:	Where use can result in skin contact, practice good personal hygiene and wear impervious gloves. Wash hands and other exposed areas with mild soap and water before eating, drinking, and when leaving work.
Hand protection:	Nitrile
General hygiene conditions:	No data available

9 Physical and chemical properties

Physical state:	Liquid
Colour:	Red
Odour:	Mild
Odour threshold:	Not determined
pH:	No data available
Melting point (°C):	No data available
Freezing point (°C):	No data available
Initial boiling point and boiling range (°C):	No data available



Date of the latest revision of the safety data sheet:12-08-2019Supercedes:24-07-2019

There are no known reactivity hazards accorded with this product
27 34
Not determined
No data available
3.9
Negligible; 0-1%
0.84
No data available
No data available
Not established
Not established
No data available
No data available
198

Reactivity:	There are no known reactivity hazards associated with this product.
Chemical stability:	Stable under normal conditions.
Possibility of hazardous reactions:	None expected under standard conditions of storage.
Conditions to avoid, including static	Temperatures above the high flash point of this combustible material in
discharge, shock or vibration:	combination with sparks, open flames, or other sources of ignition.
	Moisture (will lead to product performance degradation).
Incompatible materials:	Strong oxidizing agents
Hazardous decomposition products:	No data available

11 Toxicological information

Information on the likely routes of	Inhalation Ingestion Eve contact Skin contact
ovnosuro (inhalation ingostion skin	
exposure (initialation, ingestion, skin	
and eye contact):	
Symptoms related to the physical,	None known.
chemical and toxicological	
characteristics.	
Immediate effects from short term exposu	ıre:
Inhalation:	No hazard in normal industrial use.
Skin Contact:	This material is likely to be slightly irritating to skin based on animal data.
	Can cause minor skin irritation, defatting, and dermatitis.
Eye Contact:	This material is likely to be non-irritating to eyes based on animal data.



Date of the latest revision of the safety data sheet:12-08-2019Supercedes:24-07-2019

Ingestion:	Estimated to be > 5.0 g/kg. No hazard in normal industrial use.
Delayed and chronic effects from long tern	n exposure:
Carcinogenicity:	Not expected to cause cancer. This product meets the IP-346 criteria of <3% PAH's and is not considered a carcinogen by the International Agency for Research on Cancer.
Reproductive and Developmental	Not known or reported to cause reproductive or developmental toxicity.
Toxicity:	
Mutagenicity:	No data available to indicate product or any components present at greater than 0.1% is mutagenic or genotoxic.
Skin Contact:	Upon prolonged or repeated contact, can cause minor skin irritation, defatting, and dermatitis.
Skin Absorption:	Upon prolonged or repeated exposure, no hazard in normal industrial use.
STOT-single exposure:	Based on available data, the classification criteria are not met.
STOT-repeated exposure:	Based on available data, the classification criteria are not met.
Aspiration hazard:	Based on available data, the classification criteria are not met.

Numerical measures of toxicity, including ATEs Based on available data, the classification criteria are not met.

12 Ecological information	

Ecotoxicity (aquatic and terrestrial, if
available):Slight ecological hazard. In high concentrations, this product may be
dangerous to plants and/or wildlife.

Ecological Toxicity Data:

Chemical Name	CAS registry number and any unique identifiers	Aquatic EC50 Crustacea	Aquatic ERC50 Algae	Aquatic LC50 Fish
Petroleum distillates, hydrotreated heavy paraffinic	64742-54-7	Aquatic LC50 (48h) > 1000 mg/L	No data available	Aquatic LC50 (96h) Rainbow Trout > 5000 mg/L
Petroleum distillates, hydrotreated light paraffinic	64742-55-8	Aquatic EC50 (48h) Daphnia > 1000 mg/L	No data available	Aquatic LC50 (96h) Rainbow Trout > 5000 mg/L
Lubricating oils (petroleum), C20-50, hydrotreated neutral oil- based	72623-87-1	Aquatic EC50 (48h) Daphnia > 1000 mg/L	No data available	Aquatic LC50 (96h) > 5000 mg/L

Persistence and degradability: Bioaccumulative potential: Biodegrades slowly. Bioconcentration may occur.



Ī

Ī

Date of the latest revision of the safety data sheet:12-08-2019Supercedes:24-07-2019

Mobility in soil: Other adverse effects:	This material is expected to have essentially no mobility in soil. It absorbs strongly to most soil types. None known.
13 Disposal considerations	
Information on safe handling for disposal and methods of disposal, including any contaminated packaging:	Spent or discarded material is not expected to be a hazardous waste.
14 Transport information	
Transportation of Dangerous Goods by la	nd (TDG):
UN number: UN Proper shipping name: Transport hazard class(es): Packing group:	Not applicable Not applicable Not applicable
International carriage of dangerous goods	by sea (IMDG/IMO):
UN number: UN Proper shipping name: Transport hazard class(es): Packing group: International carriage of dangerous goods UN number: UN Proper shipping name: Transport hazard class(es): Packing group:	Not regulated by IMDG Not applicable Not applicable Solution (IATA): Not regulated by IATA Not applicable Not applicable Not applicable Not applicable
Environmental hazards according to the International Maritime Dangerous Goods Code and the United Nations Model Regulations: Transport in bulk (according to Annex II of the International Convention for the Prevention of Pollution From Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78) and the International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (IBC Code)): Special precautions in connection with	No data available



Date of the latest revision of the safety data sheet:12-08-2019Supercedes:24-07-2019

transport or conveyance either within or outside the premises:

15 Regulatory information

Safety, health and environmental regulations, made within or outside Canada, specific to the product in question: Canada - Domestic Substances List (DSL):

Chemical Name	CAS No	Canada - Domestic Substances List (DSL)
Lubricating oils (petroleum), C20-50, hydrotreated neutral oil-based	72623-87-1	Yes
Petroleum distillates, hydrotreated light paraffinic	64742-55-8	Yes
Petroleum distillates, hydrotreated heavy paraffinic	64742-54-7	Yes
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	72623-86-0	Yes

Canada - Non-Domestic Substances List (NDSL):

Chemical Name	CAS No	Canada - Non-Domestic Substances List (NDSL)
Lubricating oils (petroleum), C20-50, hydrotreated neutral oil-based	72623-87-1	No
Petroleum distillates, hydrotreated light paraffinic	64742-55-8	No
Petroleum distillates, hydrotreated heavy paraffinic	64742-54-7	No
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	72623-86-0	No

Canada - Controlled Drugs and Substances:

Chamical Nama		Schedule						
Chemical Name	CASINO	I	II	Ш	IV	v	VII	VIII
Lubricating oils								
(petroleum), C20-50,	72622 07 1	No						
hydrotreated neutral oil-	/2023-8/-1	INO						
based								
Petroleum distillates,	64742-55-8	No						



Date of the latest revision of the safety data sheet:12-08-2019Supercedes:24-07-2019

hydrotreated light paraffinic								
Petroleum distillates, hydrotreated heavy paraffinic	64742-54-7	No						
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil- based	72623-86-0	No						

Chemical Name	CAS No	Class A Precursors	Class B Precursors	Exempt Precursors	Class 1 Targeted Substances	Class 2 Targeted Substances
Lubricating oils (petroleum), C20-50, hydrotreated neutral oil- based	72623-87-1	No	No	No	No	No
Petroleum distillates, hydrotreated light paraffinic	64742-55-8	No	No	No	No	No
Petroleum distillates, hydrotreated heavy paraffinic	64742-54-7	No	No	No	No	No
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil- based	72623-86-0	No	No	No	No	No

Canada - CEPA - Schedule III Export Control List:

Chemical Name	CAS No	Part 1 Prohibited Substances	Part 2 Substances Subject to Notification or Consent	Part 3 Restricted Substances	Export Control List
Lubricating oils (petroleum), C20-50,	72623-87-1	No	No	No	No



Date of the latest revision of the safety data sheet:12-08-2019Supercedes:24-07-2019

hydrotreated neutral oil-					
based					
Petroleum distillates,					
hydrotreated light	64742-55-8	No	No	No	No
paraffinic					
Petroleum distillates,					
hydrotreated heavy	64742-54-7	No	No	No	No
paraffinic					
Lubricating oils					
(petroleum), C15-30,	72622 86 0	No	No	No	No
hydrotreated neutral oil-	12023-80-0	NU	INU	NU	INU
based					

Canada CEPA - 2015 Greenhouse Gases (GHG) Subject to Mandatory Reporting:

Chemical Name	CAS No	Canada CEPA - 2015 Greenhouse Gases (GHG) Subject to Mandatory Reporting
Lubricating oils (petroleum), C20-50,	72623-87-1	No
hydrotreated neutral oil-based		
Petroleum distillates, hydrotreated	64742-55-8	No
light paraffinic	04742-33-0	110
Petroleum distillates, hydrotreated	64742-54-7	No
heavy paraffinic	04742-34-7	
Lubricating oils (petroleum), C15-30,	72622-86-0	No
hydrotreated neutral oil-based	/2023-80-0	NO

Canada - Narcotic Control Regulations (C.R.C., c. 1041):

Chemical Name	CAS No	Canada - Narcotic Control Regulations (C.R.C., c. 1041)	
Lubricating oils (petroleum), C20-50,	72623-87-1	No	
hydrotreated neutral oil-based	. 2020 0, 2		
Petroleum distillates, hydrotreated	64742-55-8	No	
light paraffinic			
Petroleum distillates, hydrotreated	64742-54-7	No	
heavy paraffinic	0+7+2 3+ 7		
Lubricating oils (petroleum), C15-30,	72623-86-0	No	



Date of the latest revision of the safety data sheet:12-08-2019Supercedes:24-07-2019

hydrotreated neutral oil-based	

Canada - Ontario - Toxics Reduction - List of Priority Toxics:

Chemical Name	CAS No	Canada - Ontario - Toxics Reduction - List of Priority Toxics
Lubricating oils (petroleum), C20-50, hydrotreated neutral oil-based	72623-87-1	No
Petroleum distillates, hydrotreated light paraffinic	64742-55-8	No
Petroleum distillates, hydrotreated heavy paraffinic	64742-54-7	No
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	72623-86-0	No

Stockholm Convention on Persistent Organic Pollutants:

Chemical Name	CAS No	Stockholm Convention on Persistent Organic Pollutants
Lubricating oils (petroleum), C20-50, hydrotreated neutral oil-based	72623-87-1	No
Petroleum distillates, hydrotreated light paraffinic	64742-55-8	No
Petroleum distillates, hydrotreated heavy paraffinic	64742-54-7	No
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	72623-86-0	No

Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade:

Chemical Name	CAS No	Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade .
Lubricating oils (petroleum), C20-50, hydrotreated neutral oil-based	72623-87-1	No
Petroleum distillates, hydrotreated light paraffinic	64742-55-8	No
Petroleum distillates, hydrotreated	64742-54-7	No



Date of the latest revision of the safety data sheet:12-08-2019Supercedes:24-07-2019

heavy paraffinic		
Lubricating oils (petroleum), C15-30,	77672 86 0	No
hydrotreated neutral oil-based	72023-80-0	NO

(United Nations) - Kyoto Protocol - Convention on Climate Change - Greenhouse Gases (GHGs):

Chemical Name	CAS No	(United Nations) - Kyoto Protocol - Convention on Climate Change - Greenhouse Gases (GHGs)
Lubricating oils (petroleum), C20-50,	72623-87-1	No
Petroleum distillates, bydrotreated		
light paraffinic	64742-55-8	No
Petroleum distillates, hydrotreated	64742-54-7	No
heavy paraffinic		
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	72623-86-0	No

Montreal Protocol on Substances that Deplete the Ozone Layer:

Chemical Name	CAS No	Montreal Protocol on Substances that Deplete the Ozone Layer
Lubricating oils (petroleum), C20-50, hydrotreated neutral oil-based	72623-87-1	No
Petroleum distillates, hydrotreated light paraffinic	64742-55-8	No
Petroleum distillates, hydrotreated heavy paraffinic	64742-54-7	No
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	72623-86-0	No

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.:

Chemical Name	CAS No	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.
Lubricating oils (petroleum), C20-50, hydrotreated neutral oil-based	72623-87-1	No
Petroleum distillates, hydrotreated light paraffinic	64742-55-8	No
Petroleum distillates, hydrotreated	64742-54-7	No



Date of the latest revision of the safety data sheet:12-08-2019Supercedes:24-07-2019

heavy paraffinic		
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	72623-86-0	No

16 Other information	
Date of the latest revision of the safety	12-08-2019
data sheet:	
Revision Number:	12
Reason for revision:	NEW VERSION
Disclaimer:	This safety data sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in the data sheet which we have received from outside sources and we believe the information to be correct, but cannot guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product in a safe manner and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either expressed or implied.



SAFETY DATA SHEET

KLONDIKE Universal 5.1 BRAKE FLUID

SECTION 1: Identification

Product identifier Trade name KLONDIKE Universal 5.1 Brake Fluid Grades with Boiling Points >260 °C and Wet Boiling Points >165 °C Product no. 9, 10, 12, 13, 14, 118, 137, 149, 159, 160, 162, 169, 170, 176, 177, 184, 186 Relevant identified uses of the substance or mixture and uses advised against Relevant identified uses of the substance or mixture Hydraulic fluid Uses advised against No special Details of the supplier of the safety data sheet Company and address **KLONDIKE Lubricants Corporation** 3078 275th Street Langley, BC V4W 3L4 Canada **General Information** 1-877-293-4691 www.klondikelubricants.com info@klondikelubricants.com Emergency telephone number

Chemtrec (Within US)	1-800-424-9300
Chemtrec (International)	1-703-527-3887

SECTION 2: Hazard(s) identification

OSHA/HCS status

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200) Classification of the substance or mixture

Repr. 2; H361d, Suspected of damaging the unborn child.

Label elements Hazard pictogram(s)



Warning
Hazard statement(s)
Suspected of damaging the unborn child.
Safety statement(s)
General
P101, If medical advice is needed, have product container or label at hand.
Prevention
P280, Wear protective gloves/protective clothing/eye protection/face protection.
P202, Do not handle until all safety precautions have been read and understood.
Response
P301+P310, IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P305+P351+P338, IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses,
if present and easy to do. Continue rinsing.
Storage
P405, Store locked up.
Disposal
P501, Dispose of contents/container to an approved waste disposal plant.
Hazardous substances
Tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate
Other hazards
Additional labelling
Not applicable
Additional warnings
This mixture/product does not contain any substances considered to meet the criteria classifying them as
PBT and/or vPvB.

Product is not classified as combustible but will burn.

SECTION 3: Composition/Information on Ingredients

Mixtures

Product/Ingredient name	Identifiers	% w/w Classification		Note
Tris[2-[2-(2- methoxyethoxy)ethoxy]ethyl	CAS No.: 30989-05-0	30-90%	Repr. 2, H361d	
] orthoborate	EC No.: 250-418-4			
	REACH No.: 01-2119462824-33- XXXX			
	Index No.:			
Butyl Triglycol	CAS No.: 143-22-6	1-9.9%	Eye Dam. 1, H318 (SCL: 30.00 %) Eye Irrit. 2B, H320 (SCL: 20.00 %)	
	EC No.: 205-592-6			
	REACH No.: 01-2119475107-38- XXXX			
	Index No.: 603-183-00-0			
Butyl Polyglycol	CAS No.: 9004-77-7	0-5%	Eye Irrit. 2, H319 (SCL: 20.00 %)	
	EC No.: 500-012-0			
	REACH No.: 01-2119475115-41- XXXX			

	Index No.:		
2-(2-methoxyethoxy)ethanol;	CAS No.: 111-77-3	0-2.99%	Repr. 2, H361d
	EC No.: 203-906-6		
	REACH No.: 01-2119475100-52- XXXX		
	Index No.:		

603-107-00-6

See full text of H-phrases in section 16. Occupational exposure limits are listed in section 8, if these are available. Other information

SECTION 4: First-aid measures

Description of first aid measures

General information

If breathing is irregular, drowsiness, loss of consciousness or cramps: Call 911 and give immediate treatment (first aid).

Contact a doctor if in doubt about the injured person's condition or if the symptoms persist. Never give an unconscious person water or other drink.

Inhalation

Upon breathing difficulties or irritation of the respiratory tract: Bring the person into fresh air and stay with him/her.

If recovery is not rapid, seek medical attention

Skin contact

Immediately remove contaminated clothing and shoes. Ensure that skin, which has been exposed to the material, is washed thoroughly with water and soap. Skin cleanser can be used. DO NOT use solvents or thinners.

Eye contact

Remove contact lenses and open eyes widely. Flush eyes with water or saline water(20-30°C) for at least 5 minutes. If any irritation persists, seek medical assistance and continue flushing during transport. Ingestion

Provide plenty of water for the person to drink and stay with him/her. Seek medical advice immediately and bring the safety data sheet or label from the product. Do not induce vomiting, unless recommended by the doctor. Have the victim lean forward with head down to avoid inhalation of- or choking on vomited material. If medical attention is delayed, give adults 90-120 ml hard liquor such as 40% v/v spirits. Give children proportionately less at a rate of 2ml/kg body weight.

Burns

Not applicable

Most important symptoms and effects, both acute and delayed

The most important symptoms are described in sections 2 and 11. No

special

Indication of any immediate medical attention and special treatment needed

No special

Information to medics

Bring this safety data sheet or the label from this product.

Treat symptomatically. There is no specific antidote.

SECTION 5: Fire-fighting measures

Extinguishing media

Recommended: alcohol-resistant foam, carbonic acid, powder, water mist. Waterjets should not be used, since they can spread the fire. However they may be used to cool adjacent containers.

Special hazards arising from the substance or mixture

Fire will result in dense smoke. Exposure to combustion products may harm your health. Closed containers, which are exposed to fire, should be cooled with water. Do not allow fire-extinguishing water to enter the sewage system and nearby surface waters.

If the product is exposed to high temperatures, e.g. in the event of fire, dangerous decomposition compounds are produced. These are:

Carbon oxides (CO / CO).

Advice for firefighters

Wear self-contained breathing apparatus and protective clothing to prevent contact. Upon direct exposure contact the Poison Help Line on 1-800-222-1222 (24/7) in order to obtain further advice.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Avoid direct contact with spilled substances.

Avoid inhalation of vapours from spilled material.

Prevent unnecessary personnel entering area of spillage. When cleaning up large spills appropriate

protective clothing should be worn -see section 8.

Environmental precautions

Avoid discharge to lakes, streams, sewers, etc.

Methods and material for containment and cleaning up

Limit spillage and collect using granular absorbent or similar materials, and dispose of it in accordance with the regulations on dangerous waste.

Use sand, sawdust, earth, vermiculite, diatomaceous earth to contain and collect non-combustible absorbent materials and place in container for disposal, according to local regulations.

Wherever possible cleaning should be performed with normal cleaning agents. Avoid use of solvents.

Reference to other sections

See section on "Disposal considerations" in regard of handling of waste.

See section on 'Exposure controls/personal protection' for protective measures.

SECTION 7: Handling and storage

Precautions for safe handling

Avoid any method of handling that generates mists or aerosols.

Do not eat, drink or smoke when handling this product.

See section on 'Exposure controls/personal protection' for information on personal protection.

Conditions for safe storage, including any incompatibilities

Always store in containers of the same material as the original container.

Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Storage temperature

Room temperature 15 to 30°C

Specific end use(s)

This product should only be used for applications quoted in section 1.2 Users are referred to the specification SAE J1707 "Service maintenance of brake fluids".

SECTION 8: Exposure controls/personal protection

Control parameters

No substances are listed with a permissible exposure limit (ref: 29 CFR 1910.1000 TABLE Z-1)

Exposure controls

Control is unnecessary if the product is used as intended.

General recommendations Do not eat, drink or smoke in the workplace
Exposure scenarios
There are no exposure scenarios implemented for this product.
Exposure limits
Occupational exposure limits have not been defined for the substances in this product.
Appropriate technical measures
Apply standard precautions during use of the product. Avoid inhalation of gas or dust.
Hygiene measures
In between use of the product and at the end of the working day all exposed areas of the body must be washed thoroughly. Always wash hands, forearms and face
Measures to avoid environmental exposure Keep spill absorbent materials available in the workplace. If possible, clean up any spills immediately.
Individual protection measures, such as personal protective equipment
Generally
Use only protective equipment with a recognized certification mark, e.g. the UL mark.
Respiratory Equipment
No specific requirements
Skin protection
No specific requirements
Hand protection

Work situation	Material	Glove thickness (mm)	Breakthrough time (min.)	Standards	
	Butyl	0.3	> 480	EN374-2, EN374-3, EN388	
	Nitrile	0.2	> 480	EN374-2, EN374-3, EN388	

Eye protection

Work situation	Recommended	Standards	
	Wear safety glasses with side shields.	EN166	

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties Physical state

Liquid Colour Amber Odour Mild Odour threshold (ppm)

Testing not relevant or not possible due to nature of the product. pH 7-10.5 Density (g/cm³) 1.02-1.07 Viscosity (40°C) Ŭ

```
5-10 centistokes (20.00 °C)
Phase changes
    Melting point (°C)
          < -50
    Boiling point (°C)
       >260 °C
    Vapour pressure
       1.00 millibar
    Vapour density
       Testing not relevant or not possible due to nature of the product.
    Decomposition temperature (°C)
       300
    Evaporation rate (n-butylacetate = 100)
       0.01
Data on fire and explosion hazards
    Flash point (°C)
       >120 °C
    Ignition (°C)
       >280 °C
    Auto flammability (°C)
       Testing not relevant or not possible due to nature of the product.
    Explosion limits (% v/v)
       Testing not relevant or not possible due to nature of the product.
Solubility
    Solubility in water
       Soluble
    n-octanol/water coefficient
          1.50
9.2. Other information
    Solubility in fat (g/L)
       Testing not relevant or not possible due to nature of the product.
SECTION 10: Stability and reactivity
Reactivity
       No hazardous reactions if stored and handled as indicated.
Chemical stability
       The product is stable under the conditions, noted in the section "Handling and storage".
Possibility of hazardous reactions
                                           No special
                                       Conditions to avoid
       No special
Incompatible materials
       Strong acids, strong bases, strong oxidizing agents, and strong reducing agents.
Hazardous decomposition products
       The product is not degraded when used as specified in section 1.
SECTION 11: Toxicological information
Information on toxicological effects
    Acute toxicity
       Based on available data, the classification criteria are not met.
       Oral -Based on read across data toxicity is low (LD 50 Rat >5000 mg/kg). Sparse experience indicates toxicity in
       man could be greater.
       Inhalation - Not applicable due to low vapour pressure of product.
Material name: KLONDIKE Universal 5.1 Brake Fluid
```

General - Although acute toxicity of this product is low, if significant amounts are absorbed there is a risk of renal damage which could lead to kidney failure or even death. Other symptoms of overexposure include Central Nervous System effects, abdominal discomfort, metabolic acidosis and headache or nausea. Skin corrosion/irritation Based on available data, the classification criteria are not met. However, repeated contact may de-fat the skin and cause dermatitis. Serious eye damage/irritation Based on available data, the classification criteria are not met. Respiratory or skin sensitisation Based on available data, the classification criteria are not met. Germ cell mutagenicity Based on available data, the classification criteria are not met. Carcinogenicity Based on available data, the classification criteria are not met. Reproductive toxicity Suspected of damaging the unborn child. STOT-single exposure Based on available data, the classification criteria are not met. STOTrepeated exposure Based on available data, the classification criteria are not met.

Aspiration hazard

Based on available data, the classification criteria are not met. Long

Dermal - Based on read across data toxicity is low (LD 50 Rabbit >3000 mg/kg.

term effects

No special

Other information

No special

SECTION 12: Ecological information

Toxicity

Product is of low ecotoxicity Fish 96h LC50 >100mg/l (Oncorhynchus Mykiss) Daphnia 48h EC50 Not determined but expected to be virtually non-toxic Algae 72h EC50 Not determined but expected to be virtually non-toxic

Persistence and degradability

Product is inherently biodegradable and is expected to be readily biodegradable based on ingredients (OECD 302B).

If admitted into adapted biological water treatment plants no adverse effects of the degrading action of the live sludge are expected

Bioaccumulative potential

Not expected to Bio-accumulate. Log POW for all main ingredients <2.0

Mobility in soil

Product is soluble in water and will be mobile in soil until degraded. Volatilisation from water to air not expected. Results of PBT and vPvB assessment

This mixture/product does not contain any substances considered to meet the criteria classifying them as PBT and/or vPvB.

Other adverse effects

No special

SECTION 13: Disposal considerations

Waste treatment methods

Product is covered by the regulations on hazardous waste.

Dispose of in accord with local and national regulations. Recycling or controlled incineration with energy

recovery are recommended. RCRA Hazardous waste ("P" and "U" list) (40 CFR 261) None of the components are listed Specific labelling Not applicable Contaminated packing

Packaging containing residues of the product must be disposed of similarly to the product.

SECTION 14: Transport information

Not dangerous goods according to DOT, IATA and IMDG.

DOT

Not applicable

IMDG

Not applicable

IATA

Not applicable "MARINE POLLUTANT" No Environmental hazards Not applicable Special precautions for user Not applicable

Transport in bulk according to Annex II of Marpol and the IBC Code

No data available

SECTION 15: Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture **U.S.** Federal regulations **TSCA** Butyl Triglycol is listed in the non-confidential portion Butyl Polyglycol is listed in the non-confidential portion 2-(2-methoxyethoxy)ethanol; is listed in the non-confidential portion Clean Air Act Glycol ethers are regulated as a generic class under this legislation. **EPCRA Section 302** None of the components are listed **EPCRA Section 304** None of the components are listed **EPCRA** section 313 Glycol ethers are regulated as a generic class under this legislation. CERCLA Glycol ethers are regulated as a generic class under this legislation. State regulations California Prop. 65 None of the components are listed Restrictions for application No special Demands for specific education No specific requirements

Additional information

Not applicable

Chemical safety assessment

No

Sources

OSHA Hazard Communication Standard (29 CFR 1910.1200)

SECTION 16: Other information

Full text of H-phrases as mentioned in section 3 H361d, Suspected of damaging the unborn child. H318, Causes serious eye damage. H320, Causes eye irritation. H319, Causes serious eye irritation. Abbreviations and acronyms ACGIH = American Conference of Governmental Industrial Hygienists ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor CAS = Chemical Abstracts Service CERCLA = Comprehensive Environmental Response Compensation and Liability Act EINECS = European Inventory of Existing Commercial chemical Substances EPCRA = Emergency Planning and Community Right-To-Know Act GHS = Globally Harmonized System of Classification and Labelling of Chemicals HCIS = Hazardous Chemical Information System IARC = International Agency for Research on Cancer IATA = International Air Transport Association IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) NFPA = National Fire Protection Association NIOSH = National Institute for Occupational Safety and Health OECD = Organisation for Economic Co-operation and Development OSHA = Occupational Safety and Health Administration RCRA = Resource Conservation and Recovery Act RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail RRN = REACH Registration Number SARA = Superfund Amendments and Reauthorization Act STEL = Short-term exposure limits STOT-RE = Specific Target Organ Toxicity - Repeated Exposure STOT-SE = Specific Target Organ Toxicity - Single Exposure TSCA = The Toxic Substances Control Act TWA = Time weighted average UN = United Nations UVCB = Complex hydrocarbon substance VOC = Volatile Organic Compound Additional information In accordance with OSHA CFR 1910.1200 the evaluation of the classification of the mixture is based on: The classification of the mixture in regard of health hazards are in accordance with the calculation methods given by HCS (29 CFR 1910.1200).

The information contained herein is based on the present knowledge and experience of Orthene Chemicals Ltd. It in no way constitutes the users own assessment of work place risk as required by other Health and Safety legislation.

Orthene Chemicals Ltd. does not, by supplying this information, guarantee or warrant any specific properties or qualities of goods supplied. It is the responsibility of the purchaser to determine whether the goods ordered are fit for any purpose for which they may be required.

This information is provided subject to Orthene Chemicals Limited's Conditions of Sale, and in particular

Conditions 9 and 14 thereof. The safety data sheet is validated by

Steve Jay

Other

A change (in proportion to the last essential change (first cipher in SDS version, see section 1)) is marked with a blue triangle.

The information in this safety data sheet applies only to this specific product (mentioned in section 1) and is not necessarily correct for use with other chemicals/products.

It is recommended to hand over this safety data sheet to the actual user of the product. Information in this safety data sheet cannot be used as a product specification.

Cloverdale Paint PREMIUM CL Safety Data Sheet

according to the Hazardous Products Regulation (February 11, 2015) Date of issue: 05/08/2017 Revision date: 03/15/2021

SECTION 1: Identification	
1.1. Product identifier	
Product form	: Mixture
Product name	: INTERIOR FLAT ACRYLIC LATEX WHITEBASE- PREMIUM CLASSIC
Product code	: 03123
Product group	: Trade product
1.2. Recommended use and restrictions of	on use
Recommended use	: Coatings and paints
1.3. Supplier	
Cloverdale Paint Inc. 400- 2630 Croydon Drive V3Z 6T3 SURREY - CANADA T 1-(604)-596-6261 www.cloverdalepaint.com	
1.4. Emergency telephone number	
Emergency number	: 613-996-6666
SECTION 2: Hazard identification	
2.1. Classification of the substance or mi	xture
Classification (GHS-CA)	
Skin sensitisation, H317	
Category 1 Carcinogenicity, H351	
Full text of H statements : see section 16	
2.2 GHS I abel elements including preca	utionary statements
GHS-CA labelling	
Hazard nictograms (GHS-CA)	
Signal word (GHS-CA)	: Warning
Hazard statements (GHS-CA)	: H317 - May cause an allergic skin reaction. H351 - Suspected of causing cancer.
Precautionary statements (GHS-CA)	 P201 - Obtain special instructions before use. P202 - Do not handle until all safety precautions have been read and understood. P261 - Avoid breathing mist, vapours, spray. P272 - Contaminated work clothing should not be allowed out of the workplace. P280 - Wear eye protection, face protection, protective gloves, protective clothing. P302+P352 - IF ON SKIN: Wash with plenty of soap & water. P308+P313 - IF exposed or concerned: Get medical advice/attention. P333+P313 - If skin irritation or rash occurs: Get medical advice/attention. P362+P364 - Take off contaminated clothing and wash it before reuse. P405 - Store locked up. P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation
2.3. Other hazards	
Other hazards not contributing to the classification	: None under normal conditions.
2.4. Unknown acute toxicity (GHS-CA)	

No data available

Safety Data Sheet

according to the Hazardous Products Regulation (February 11, 2015)

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable				
3.2. Mixtures				
Name	Chemical name / Synonyms	Product identifier	%	Classification (GHS-CA)
TITANIUM DIOXIDE	C.I. 77891 / C.I. Pigment White 6 / Titanium oxide (TiO2) / CI 77891 / Titanium(IV) oxide / C.I. Pigment White 7 / Pigment White 6 / Titanium dioxide nanoparticles / TITANIUM DIOXIDE / Titanium oxide	(CAS-No.) 13463-67-7	11.4	Carc. 2, H351
Latex Resin			10.2	Skin Sens. 1, H317

Full text of hazard classes and H-statements : see section 16

SECTION 4: First-aid measures	
4.1. Description of first aid measures	
First-aid measures after inhalation	: Remove person to fresh air and keep comfortable for breathing.
First-aid measures after skin contact	: Wash skin with plenty of water.
First-aid measures after eye contact	: Rinse eyes with water as a precaution.
First-aid measures after ingestion	: Call a poison center or a doctor if you feel unwell.
First-aid measures general	: IF exposed or concerned: Get medical advice/attention.
4.2. Most important symptoms and effect	s (acute and delayed)
Symptoms/effects	: Not expected to present a significant hazard under anticipated conditions of normal use.
Symptoms/effects after inhalation	: None under normal use.
Symptoms/effects after skin contact	: Slight irritation.
Symptoms/effects after eye contact	: Direct contact with the eyes is likely to be irritating.
Symptoms/effects after ingestion	: Swallowing a small quantity of this material will result in serious health hazard.
4.3. Immediate medical attention and spe	cial treatment, if necessary
Other medical advice or treatment	: Treat symptomatically.

SECTI	ON 5: Fire-fighting measures	
5.1.	Suitable extinguishing media	
Suitable	extinguishing media	: Sand. Water fog. Dry chemical. Appropriate media for surrounding fire. Water spray. Dry powder. Foam. Carbon dioxide.
5.2.	Unsuitable extinguishing media	
No additi	ional information available	
5.3.	Specific hazards arising from the ha	zardous product
Fire haza	ard	: Not flammable.
Explosio	n hazard	: Risk of explosion if heated under confinement.
5.4.	Special protective equipment and pr	ecautions for fire-fighters
Firefighti	ng instructions	: Use water spray or fog for cooling exposed containers.
Protectio	n during firefighting	: Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTI	ON 6: Accidental release meas	su	'es
6.1.	Personal precautions, protective equipment and emergency procedures		
No additi	onal information available		
6.2.	Methods and materials for containm	en	t and cleaning up
For conta	ainment	:	Collect spillage.
Methods	for cleaning up	:	Take up liquid spill into absorbent material. Notify authorities if product enters sewers or public waters.
Other inf	ormation	:	Dispose of materials or solid residues at an authorized site.
6.3.	Reference to other sections		

For further information refer to section 8: "Exposure controls/personal protection"

Safety Data Sheet

according to the Hazardous Products Regulation (February 11, 2015)

SECTION 7: Handling and storage	
7.1. Precautions for safe handling	
Precautions for safe handling	: Ensure good ventilation of the work station. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Take all necessary technical measures to avoid or minimize the release of the product on the workplace. Limit quantities of product at the minimum necessary for handling and limit the number of exposed workers. Provide local exhaust or general room ventilation. Wear personal protective equipment. Floors, walls and other surfaces in the hazard area must be cleaned regularly.
Hygiene measures	: Separate working clothes from town clothes. Launder separately. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.
7.2. Conditions for safe storage, includin	g any incompatibilities
Technical measures	: Comply with applicable regulations.
Storage conditions	: Protect from freezing. Keep container closed when not in use. Store locked up. Store in a well-ventilated place. Keep cool.
Incompatible products	: Oxidizing agent. Strong bases.
Special rules on packaging	: Store in a closed container.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

TITANIUM DIOXIDE (13463-67-7)				
USA - ACGIH	ACGIH TWA (mg/m³)	10 mg/m³		
USA - OSHA	OSHA PEL (TWA) (mg/m³)	15 mg/m³ (total dust)		
Canada (Quebec)	VEMP (mg/m ³)	10 mg/m ³ (containing no Asbestos and <1% Crystalline silica-total dust)		
Alberta	OEL TWA (mg/m ³)	10 mg/m³		
British Columbia	OEL TWA (mg/m³)	10 mg/m³ (total dust)		
Manitoba	OEL TWA (mg/m ³)	10 mg/m³		
New Brunswick	OEL TWA (mg/m ³)	10 mg/m ³		
New Foundland & Labrador	OEL TWA (mg/m ³)	10 mg/m ³		
Nova Scotia	OEL TWA (mg/m ³)	10 mg/m ³		
Nunavut	OEL STEL (mg/m ³)	20 mg/m ³		
Nunavut	OEL TWA (mg/m ³)	10 mg/m ³		
Northwest Territories	OEL STEL (mg/m ³)	20 mg/m ³		
Northwest Territories	OEL TWA (mg/m ³)	10 mg/m ³		
Ontario	OEL TWA (mg/m ³)	10 mg/m ³		
Prince Edward Island	OEL TWA (mg/m ³)	10 mg/m ³		
Saskatchewan	OEL STEL (mg/m ³)	20 mg/m ³		
Saskatchewan	OEL TWA (mg/m ³)	10 mg/m ³		
Yukon	OEL STEL (mg/m ³)	20 mg/m ³		
Yukon	OEL TWA (mg/m ³)	30 mppcf		
8.2. Appropriate enginee	ring controls			

Appropriate engineering controls

Environmental exposure controls

Ensure good ventilation of the work station.Avoid release to the environment.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

Safety glasses. Gloves. Protective clothing. Insufficient ventilation: wear respiratory protection.

Hand protection:

Protective gloves

Eye protection:

Safety glasses

Skin and body protection:

Wear suitable protective clothing

Respiratory protection:

Safety Data Sheet

according to the Hazardous Products Regulation (February 11, 2015)

[In case of inadequate ventilation] wear respiratory protection.

Personal protective equipment symbol(s):



Other information:

Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties		
9.1. Information on basic physical and c	hemical properties	
Physical state	: Liquid	
Appearance	: Liquid.	
Colour	: white	
Odour	: Amine-like	
Odour threshold	: No data available	
рН	: 8.5 - 9.5	
Relative evaporation rate (butylacetate=1)	: No data available	
Relative evaporation rate (ether=1)	: No data available	
Melting point	: Not applicable	
Freezing point	: ≈0 °C	
Boiling point	: ≈ 100 °C	
Flash point	: No data available	
Auto-ignition temperature	: No data available	
Decomposition temperature	: No data available	
Flammability (solid, gas)	: Non Flammable Not applicable	
Vapour pressure	: No data available	
Vapour pressure at 50 °C	: No data available	
Specific gravity	: 1.5	
Density	: 12.2 lb/gal	
Solubility	: No data available	
Log Pow	: No data available	
Viscosity, kinematic	: No data available	
Explosive limits	: No data available	
9.2. Other information		
VOC content	: < 50 g/l	
SECTION 40: Stability and reactivity		

To. Stability and reacti	ivity	
activity		
	:	The product is non-reactive under normal conditions of use, storage and transport.
bility	:	Stable under normal conditions.
hazardous reactions	:	No dangerous reactions known under normal conditions of use.
avoid	:	None under recommended storage and handling conditions (see section 7).
materials	:	Strong acids. Strong bases.
ecomposition products	:	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	activity bility hazardous reactions avoid materials ecomposition products	activity : bility : hazardous reactions : avoid : materials : ecomposition products :

SECTION 11: Toxicological informat	ion
11.1. Information on toxicological effects	
Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Not classified

Safety Data Sheet

according to the Hazardous Products Regulation (February 11, 2015)

TITANIUM DIOXIDE (13463-67-7)	
LD50 oral rat	> 10000 mg/kg
Skin corrosion/irritation	: Not classified
	pH: 8.5 - 9.5
Serious eye damage/irritation	Not classified
	pH: 8.5 - 9.5
Respiratory or skin sensitization	: May cause an allergic skin reaction.
Germ cell mutagenicity	Not classified
Carcinogenicity	: Suspected of causing cancer.
IARC group	: 3 - Not classifiable3 - Not classifiable
Reproductive toxicity	Not classified
STOT-single exposure	Not classified
STOT-repeated exposure	Not classified
Aspiration hazard	: Not classified
Likely routes of exposure	Skin and eyes contact.
Symptoms/effects	Not expected to present a significant hazard under anticipated conditions of normal use.
Symptoms/effects after inhalation	None under normal use.
Symptoms/effects after skin contact	: Slight irritation.
Symptoms/effects after eye contact	Direct contact with the eyes is likely to be irritating.
Symptoms/effects after ingestion	Swallowing a small quantity of this material will result in serious health hazard
e jingteme en ette anter ingeotion	

SECTION 12: Ecological information	
12.1. Toxicity	
Ecology - general	: The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment.
Acute aquatic toxicity	: Not classified
Chronic aquatic toxicity	: Not classified

12.2. Persistence and degradability

INTERIOR FLAT ACRYLIC LATEX WHITEBASE- PREMIUM CLASSIC		
Persistence and degradability	Not established.	
12.3. Bioaccumulative potential		
No additional information available		
12.4. Mobility in soil		
No additional information available		
12.5. Other adverse effects		
Ozone	: Not classified	

SECTION 13: Disposal considerations				
13.1. Disposal methods				
Waste treatment methods	: Dispose of contents/container in accordance with licensed collector's sorting instructions.			
Product/Packaging disposal recommendations	: Avoid release to the environment. Dispose in a safe manner in accordance with local/national regulations.			
Additional information	: Clean up even minor leaks or spills if possible without unnecessary risk.			
Ecology - waste materials	: Avoid release to the environment.			

SECTION 14: Transport inform	ation	
14.1. Basic shipping description		
In accordance with TDG		
Transportation of Dangerous Goods		
UN-No. (TDG)	: Not Regulated	
Transport document description	: Not Regulated	

Safety Data Sheet

according to the Hazardous Products Regulation (February 11, 2015)

14.2. Transport inf	ormation/DOT	
Department of Trapen	ort	
DOT NA no. Transport document des Contains Statement Fiel Dangerous for the enviro Other information	: No cription : No d Selection (DOT) : onment : No : No	ot Regulated ot Regulated o o supplementary information available.
14.3. Air and sea to	ansport	
IMDG UN-No. (IMDG) Transport document des IATA UN-No. (IATA) Transport document des	: No cription (IMDG) : Uf : No cription (IATA) : Uf	ot Regulated N Not Regulated ot Regulated N Not Regulated
SECTION 15: Reg	ulatory information	
15.1. National regulation	ons	
INTERIOR FLAT ACR Listed on the Canadian TITANIUM DIOXIDE (* Listed on the Canadian	YLIC LATEX WHITEBASE- P DSL (Domestic Substances L 13463-67-7) DSL (Domestic Substances L	REMIUM CLASSIC .ist) .ist)
15.2. International regu	llations	
Latex Resin Not listed on the United	d States TSCA (Toxic Substan	ces Control Act) inventory
TITANIUM DIOXIDE (Listed on the AICS (Au Listed on IECSC (Inve Listed on the EEC inve Listed on the Japanese Listed on the Japanese Listed on the Korean E Listed on the Korean E Listed on NZIOC (New Listed on PICCS (Phili Listed on the United S' Listed on INSQ (Mexic	13463-67-7) Instralian Inventory of Chemical Intory of Existing Chemical Sub Entory EINECS (European Inve E ENCS (Existing & New Chemical ISHL (Industrial Safety and H ICL (Existing Chemicals List) Zealand Inventory of Chemicals popines Inventory of Chemicals itates TSCA (Toxic Substances an National Inventory of Chemicals	Substances) stances Produced or Imported in China) intory of Existing Commercial Chemical Substances) nical Substances) inventory lealth Law) ls) and Chemical Substances) Control Act) inventory ical Substances)
SECTION 16: Othe	er information	
Date of issue Revision date Training advice Other information Full text of H-statements	: 05 : 03 : No : No	5/08/2017 3/15/2021 ormal use of this product shall imply use in accordance with the instructions on the packaging. one.
H317	May cause an allergic skin re	action.
H351	Suspected of causing cancer	·

SDS Canada (GHS)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product



AVIATION FUEL (JET A-1, JP-5, JP-8, AN-8)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1. Product identifier

Commercial name:

Substance name:n/a (mixture)EINECS Number:n/a (mixture)Registration Number (EC Regulation 1907/2006):n/a (mixture)CAS Number:n/a (mixture)

AVIATION FUEL (JET A-1, JP-5, JP-8, AN-8) n/a (mixture) n/a (mixture) n/a (mixture) n/a (mixture)

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use:

Manufacture (industrial), distribution (industrial), formulation and (re)packing (industrial). Use as a fuel (professional, consumer)

1.3. Details of the supplier of the Safety Data Sheet

Manufacturer

Supplier: Address: Telephone number: Fax number: e-mail address: e-mail contact for MSDS: MOTOR OIL (HELLAS), CORINTH REFINERIES S.A

Shell & MOH Aviation Fuels A.E. 151, Kifissias Ave, Maroussi, 151 24, Greece +30 210 6006 380-1 +30 210 6083 820 info@shell-moh.com If you have any enquiries about the content of this MSDS, please email: ops@shell-moh.com

1.4. Emergency telephone number

National emergency centre: National poison centre: 166 +30 210-7793777

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

2.1.1. Classification according to Regulation (EC) 1272 / 2008 [CLP]

Flam. Liquid 3	H226
Skin Irrit. 2	H315
Asp.Tox. 1	H304
STOT Single Exp. 3	H336
Aquatic Chronic 2	H411

Page 1 of 38

2.1.2. Additional information

No additional information available.

2.2. Label elements

2.2.1. Labelling according to Regulation (EC) 1272/2008 [CLP]

Hazard pictogram (CLP):

	GHS	S02 GHS07 GHS08 GHS09
Signal word:	Danger	
Hazard statements:	H226 H304 H315 H336 H411	Flammable liquid and vapour. May be fatal if swallowed and enters airways. Causes skin irritation. May cause drowsiness or dizziness. Toxic to aquatic life with long lasting effects.
Precautionary statements:	P102 P210 P273 P280 P331 P301+ P310	Keep out of reach of children. Keep away from heat/sparks/open flames//hot surfaces. No smoking. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/ face protection. Do NOT induce vomiting. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

2.3. Other hazards

The substance is not considered to be PBT nor vPvB.

3. COMPOSITION INFORMATION ON INGREDIENTS

CAS No	EC No	Index No	REACH Registration No	% weight	Name	Classification according to Regulation EC 1272/2008 (CLP)
91770-15-9	294- 799-5	649-427- 00-X	01-2119502385- 46-0057	99.85-100	Kerosine (petroleum), sweetened; Kerosine - unspecified	Flam. Liquid 3; H226 Skin Irrit. 2; H315 Asp. Tox. 1; H304 STOT Single Exp.3; H336 Aquatic Chronic 2; H411
111-77-3	203- 906-6	603-107- 00-6	01-2119475100- 52-XXXX	0-0.15	2-(2-Methoxy ethoxy) ethanol	Repr. Cat. 2; H361d

May also contain additives at <0.1% v/v each.
4. FIRST AID MEASURES

4.1. Description of first aid measures

General notes:	Spillages make surface slippery. Before attempting to rescue casualties, isolate area from all potential sources of ignition including disconnecting electrical supply. Ensure adequate ventilation and check that a safe, breathable atmosphere is present before entry into confined spaces. Drench contaminated clothing with water before removing to avoid risk of sparks from static electricity. (Subject to applicability) Hydrogen sulphide (H ₂ S) can accumulate in the headspace of storage tanks and reach potentially hazardous concentrations.
Inhalation:	 Inhalation is unlikely because of the low vapour pressure of the substance at ambient temperature. Exposure to vapours may however occur when the substance is handled at high temperatures with poor ventilation. If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If the casualty is unconscious and: * Not breathing – ensure that there is no obstruction to breathing and give artificial respiration by trained personnel. If necessary, give external cardiac massage and obtain medical assistance. * Breathing - place in the recovery position and keep the head below the level of the torso. Administer oxygen if necessary; Obtain medical attention if casualty has an altered state of consciousness or if symptoms do not resolve. (Subject to applicability) If there is any suspicion of inhalation of H₂S: * Remove casualty to fresh air as quickly as possible. * Immediately begin artificial respiration if breathing has ceased. * Provision of oxygen may help. * Obtain medical advice for further treatment.
Skin contact:	Remove contaminated clothing and footwear, and dispose of safely. Wash affected area with soap and water. Seek medical attention if skin irritation, swelling or redness develops and persists. When using high-pressure equipment, injection of product can occur. If high-pressure injuries occur, immediately seek professional medical attention. Do not wait for symptoms to develop. For minor thermal burns: Cool the burn. Hold the burned area under cold running water for at least five minutes, or until the pain subsides. However, body hypothermia must be avoided.
Eye contact:	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing. If irritation, blurred vision or swelling occurs and persists, obtain medical advice from a specialist.
Ingestion/Aspiration:	In case of ingestion, always assume that aspiration has occurred. The casualty should be sent immediately to a hospital. Do not wait for symptoms to develop. Do not induce vomiting, as there is high risk of aspiration. Do not give anything by mouth to an unconscious person.
Self-protection of the first aider:	First aid personnel must be aware of personal risk during rescue. Use personal protective equipment. See section 8 for more detail.

4.2. Most important symptoms and effects, both acute and delayed

Following inhalation:	Inhalation of vapours may cause headache, nausea, vomiting and an altered state of consciousness
Following skin contact:	Reddening, irritation
Following eye contact:	Slight irritation (unspecific)
Following ingestion/ aspiration:	Few or no symptoms expected. If any, nausea and diarrhea might occur.

4.3. Indication of any immediate medical attention and special treatment needed

Treat accordingly depending on the type of exposure.

5. FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media:	Foam (Specifically trained personnel only) Water fog (Specifically rained personnel only) Dry chemical powder Carbon dioxide
Unsuitable extinguishing media:	Other inert gases (subject to regulations) Sand or earth Do not use direct water jets on the burning product; they could cause splattering and spread the fire. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

5.2. Special hazards arising from the substance or mixture

This substance will float and can be reignited on surface water. **Hazardous combustion products:**

Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates and gases, including carbon monoxide and unidentified organic and inorganic compounds. If sulfur compounds are present in appreciable amounts, combustion products may include also H_2S and SO_x (sulfur oxides) or sulfuric acid.

5.3. Advice for fire-fighters

Protective equipment for fire fighters:

In case of a large fire or in confined or poorly ventilated spaces wear full fire resistant protective clothing and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. ACCIDENTAL RELEASE MEASURES

General information

Stop or contain leak at the source, if safe to do so. Avoid direct contact with released material. Stay upwind. In case of large spillages, alert occupants in downwind areas.

Keep non-involved personnel away from the area of spillage. Alert emergency personnel. Except in case of small spillages, the feasibility of any actions should always be assessed and advised, if possible, by a trained, competent person in charge of managing the emergency.

Eliminate all ignition sources, if safe to do so (e.g. electricity, sparks, fires, flares).

(Subject to applicability): In those cases when the presence of dangerous amounts of H₂S around the spilled product is suspected or proved, additional or special actions may be warranted, including access restrictions, use of special protection equipment, procedures and personnel training.

If required, notify relevant authorities according to all applicable regulations.

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non- emergency personnel:	Wear Personal Protective Equipment (PPE) listed in Section 8. Stand upwind from the spill site. Ensure adequate ventilation. Eliminate all ignition sources (electricity, sparks, fires, flares, smoking). Avoid contact with skin, eye and clothing.
6.1.2. For emergency	<u>Small spillages:</u> normal antistatic working clothes are usually adequate.
responders:	<u>Large spillages:</u> full body suit of chemically resistant and antistatic material.
	Work gloves providing adequate chemical resistance, specifically to
	aromatic hydrocarbons. Note: gloves made of PVA are not water-resistant
	and are not suitable for emergency use.
	Work helmet. Antistatic non-skid safety shoes or boots. Goggles or face shield, if splashes or contact with eves is possible or anticipated
	Respiratory protection: A half or full-face respirator with filter(s) for
	organic vapours (and when applicable for H ₂ S) or a Self Contained
	Breathing Apparatus (SCBA) can be used according to the extent of spill
	and predictable amount of exposure. If the situation cannot be
	completely assessed, or if an oxygen deficiency is possible, only SCBAs should be used.

6.2. Environmental precautions

Spillages onto land: Prevent product from entering sewers, rivers, waterways or other bodies of water. Prevent product from contaminating soil or ground water system.

6.3. Methods and material for containment and cleaning up

6.3.1. For containment:	Spillages onto land: If necessary dike the product with dry earth, sand or similar non-combustible materials.		
	Large spillages may be cautiously covered with foam, if available, to limit fire risk. Do not use direct jets.		
	<u>Spillages on water or at sea</u> : In case of small spillages in closed waters (i.e. ports) contain product with floating barriers or other equipment. Large spillages in open waters should be contained with floating barriers or other mechanical means. Control the spreading of the spillage.		
6.3.2. For cleaning up:	The use of dispersants should be advised by an expert and approved by local authorities.		
	REMARK: in case of interior space (e.g. inside buildings or confined spaces) ensure adequate ventilation.		
	Spillages onto land: Absorb spilled product with suitable non-		
	combustible materials. Collect free product with suitable means and		
	transfer collected product and other contaminated materials to suitable containers for recycle, recovery or safe disposal according to relevant regulations.		
	In case of soil contamination, remove contaminated soil and treat this in accordance with local regulations.		
	Page 6 of $\overline{38}$		

	<u>Spillages on water or at sea</u> : In case of small spillages, contain spilled product and collect it by absorbing with specific floating absorbents. In case of large spillages in open waters collect the product by skimming or other suitable mechanical means, only if fire/explosion risks can be adequately prevented. Collect recovered product and other materials in suitable tanks or containers for recovery or safe disposal according to relevant regulations.	
6.3.3. Other information:	Recommended measures are based on the most likely spillage scenarios for this material; however, local conditions (wind, air temperature, wave/current direction and speed) may significantly influence the choice of appropriate actions. For this reason, local experts should be consulted when necessary. Local regulations may also prescribe or limit actions to be taken. (Subject to applicability) Concentration of H ₂ S in tank headspaces may	
	reach hazardous values, especially in case of prolonged storage. This situation is especially relevant for those operations, which involve direct exposure to the vapours in the tank. (Subject to applicability) Spillages of limited amounts of products,	
	especially in the open air when vapours will be usually quickly dispersed, are dynamic situations, which are unlikely to entail exposure to dangerous concentrations. As H ₂ S has a density greater than ambient air, a possible exception may regard the build-up of dangerous concentrations in specific spots, like trenches, depressions or confined spaces. In all these circumstances, however, the correct actions should	
	be assessed on a case-by-case basis.	

6.4. Reference to other sections

Personal Protective Equipment: See Section 8 for more details. Waste Treatment: See Section 13

7. HANDLING AND STORAGE

General information:

A specific assessment of inhalation risks from the presence of H_2S in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases must be made to help determine controls appropriate to local circumstances.

The vapour is heavier than air. Beware of accumulation in pits and confined spaces.

7.1. Precautions for safe handling

Prevention of fire:	Risk of explosive mixtures of vapour and air. Ensure that all relevant regulations regarding explosive atmospheres, and handling and storage facilities of flammable products, are followed. Ground/bond containers, tanks and transfer/receiving equipment. Use and store only outdoors or in a well-ventilated area. Take precautionary measures against static electricity. Use explosion-proof electrical/ventilating/lighting equipment Use only non-sparking tools. Keep away from heat/sparks/open flames/hot surfaces. – No smoking
Prevention of aerosol and dust generation:	Do not use compressed air for filling, discharging, or handling operations.

Protection of the

environment: Hygiene measures:	Avoid contact with skin and eyes. Never siphon by mouth. Do not ingest. Avoid breathing vapours. Use personal protective equipment as required (see Section 8). For more information regarding protective equipment and operational conditions see Exposure Scenarios. Ensure that proper housekeeping measures are in place. Contaminated materials should not be allowed to accumulate in the workplace and should never be kept inside the pockets. Keep away from food and beverages. Do not eat, drink or smoke while using this product. Wash the hands thoroughly after handling. Change contaminated clothes at the end of working shift.
7.2. Conditions from safe	storage, including any incompatibilities
Technical measures and storage conditions:	 Storage installations should be designed with adequate bunds so as to prevent ground and water pollution in case of leaks or spills. Cleaning, inspection and maintenance of internal structure of storage tanks must be done only by properly equipped and qualified personnel as defined by national, local or company regulations. Before entering storage tanks and commencing any operation in a confined area, check the atmosphere for oxygen content and flammability. If sulphur compounds are suspected to be present in the product, check the atmosphere for H₂S content. If the product is supplied in containers: * Keep only in the original container or in a suitable container for this kind of product. * Keep containers tightly closed and properly labeled. Protect from the sunlight. * Light hydrocarbon vapours can build up in the headspace of containers. These can cause flammability / explosion hazards. Open slowly in order to control possible pressure release. * Empty containers may contain flammable product residues. Do not weld, solder, drill, cut or incinerate empty containers, unless they have been properly cleaned.
Packing materials:	<u>Recommended materials:</u> For containers, or container linings use mild steel, stainless steel. <u>Unsuitable materials:</u> some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Compatibility should be checked with the manufacturer.
Requirements for storage:	Storage area layout, tank design, equipment and operating procedures must comply with the relevant European, national or local legislation.
Storage class:	Category II according to national legislation (Ministerial Decision 34458/1990)
Further information on storage conditions:	Store separately from oxidizing agents.

7.3. Specific end use(s)

See Exposure scenarios in the Annex

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

8.1.1. Limit values:

National occupational exposure limit values: Not reported National biological limit values: Not reported

International occupational exposure limit values:

Since no occupational exposure limit values are reported for kerosine CAS No 91770-15-9, the limits below that have been published for kerosine CAS No 8008-20-6*, have been considered appropriate for kerosene CAS No 91770-15-9 streams as well.

Substance	Kerosine			
Cas No	8008-20-6			
	Limit value - Eight hours Limit value - Short term			Short term
	ppm	mg/m ³	ppm	mg/m ³
Belgium		200		
Canada - Ontario		200 (1) (2)		
Ireland		100		
South Korea		200		
USA-NIOSH		100		

Remarks:

Canada-Ontario: (1) Jet fuels, as total hydrocarbon vapour (2) Application restricted to conditions in which there are negligible aerosol exposures

*CAS No 8008-20-6: Kerosine (petroleum); straight run Kerosine; a complex of HC produced by the distillation of crude oil. It consists of HC having carbon numbers predominantly in the range of C9 through C16 and boiling in the range of 130 °C to 290 °C

Substance	2-(2-Methoxyethoxy)ethanol			
Cas No	111-77-3			
	Limit value -	Eight hours	Limit value - Short term	
	ppm	mg/m ³	ppm	mg/m ³
Austria	10	50,1		
Belgium	10	50,1		
Denmark	25 provisional			
European Union	10	50,1		
Finland	10	50		
France	10	50,1		
Germany (AGS)	10(1)	50 (1)		
Hungary		50,1		
Ireland	10	15,1		
Italy	10	50,1		
Latvia	20	100		
Poland		50		
Spain	10	50,1		
The Netherlands		45		
United Kingdom	10	50,1		

Remarks:

European Union: Bold-type: Indicative occupational exposure limit value and limit value for occupational exposure France: Italic type: Indicative statutory limit values Germany (AGS): (1) Inhalable aerosol and vapour Italy: Skin Spain: Skin

8.1.2. Monitoring procedures:

Monitoring of the air in confined places using gas detectors to detect and monitor presence of H2S, oxygen deficient conditions and explosive atmospheres. Refer to BS EN 14042:2003 "Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents", BS EN 1127-1:2007 "Explosive atmospheres-explosion prevention and protection", ES EN 60079-0:2009 "Explosive atmospheres-equipment general requirements"

8.1.3. Exposure limit values for air contaminants formed when using the substance/mixture Not reported

8.1.4. Derived No Effect Level (DNEL) and Predicted No Effect Concentration (PNEC)

DNEL Worker (industrial /professional)

Chemical name	Short term, systematic effects	Short term, local effects	Long term, systemic effects	Long term, local effects
Kerosines	Dermal (a)	Dermal (b)	Dermal (a)	Dermal (b)
	Inhalation (a)	Inhalation (a)	Inhalation (a)	Inhalation (a)

(a) No hazard identified for this route (data available)

(b) The data do not allow setting a DNEL

DNEL Consumer/General population

Chemical name	Short term, systematic effects	Short term, local effects	Long term, systemic effects	Long term, local effects
Kerosines	Dermal (a)	Dermal (b)	Dermal (a)	Dermal (b)
	Inhalation (a)	Inhalation (a)	Inhalation (a)	Inhalation (a)
			Oral: 19 mg/kg/24h	

(a) No hazard identified for this route (data available)

(b) The data do not allow setting a DNEL

PNEC

Substance is a hydrocarbon UVCB. Conventional methods of deriving PNECs are not appropriate for such complex substances.

8.1.5. Use of control banding approach

See Section 7 and 8.2

8.2. Exposure control

8.2.1. Appropriate engineering controls:

Storage and handling in closed systems. Use sealed systems as far as possible. Local exhaust ventilation is recommended.

Provide basic employee training to prevent/minimise exposure.

Hazard recognition and risk assessment should be conducted for each work. Confined space entry procedures should be followed (e.g. work permit, gas measurements etc). Do not enter empty storage tanks until measurements of available oxygen have been carried out.

Draining, flushing and/or purging of the equipment prior to any disassembly work.

8.2.2. Personal protection equipment:

	IF	PPE	STANDARD
Eye and face protection	Splashing is likely	Protective shield and /or safety goggles should be used	EN 166
Hand protection	There is potential for exposure	Impervious gloves	EN 374
Other skin protection	There is potential for exposure	Impervious protective clothing	EN 340
Respiratory protection	There is vapour formation	Full face masks with gas filters for organic vapours	EN 14387, EN 136, EN 137
Thermal Hazards	Large scale fires	Fire resistant coveralls with self-contained breathing apparatus	EN 340, EN 469, EN 1486, EN 137

8.2.3. Environmental exposure controls:

See sections 6, 7 and exposure scenarios in the Annex.

9. PHYSICAL AND CHEMICAL PROPERTIES

	9.1	1.]	Inform	nation	on	basic	ph	vsical	and	chemical	pro	perties
--	-----	------	--------	--------	----	-------	----	--------	-----	----------	-----	---------

(a) (b) (c) (d)	Appearance Odour Odour threshold pH	: Low viscosity, liquid (at 20 ^o C and 101.3 Kpa) : Characteristic (hydrocarbon-like) : Not available : Not applicable
(e)	Melting point/freezing point	: Freezing point is below -20°C
(f)	Initial boiling point and boiling range	: 13 0-290 °C
(g)	Flash point	: The flash point is 29 - 70°C (CONCAWE 2010a) (EN ISO 2719, 13736 and ASTM D 9302a)
(h)	Evaporation rate	: Not available
(i)	Flammability (solid, gas) Flammability (liquid)	: Not applicable : Flammable liquid (cat.3)
(j)	Upper/lower flammability or explosive limits	: Not applicable
(k)	Vapour pressure	: The vapour pressure for kerosines ranges from <1 kPa to 3.7 kPa at 37.8 $^{\circ}\mathrm{C}$
(I)	Vapour density	: Not available Page 12 of 38

: The absolute density ranges from 0.77 to 0.85 g/cm3 at

- (n) Solubility in water
 - Partition coefficient: n-octanol/water
- (0) (p) Auto-ignition temperature
- (q) Decomposition temperature
- (r) Viscosity
- Explosive properties (s)
- Oxidising properties (t)

- 15 °C (CONCAWE, 2010a),(ASTM D-4052, EN ISO 12185)
- : Not applicable
- : Not applicable
 - : 220°C to 550°C (ASTM E 659 test method)
- : Not available
- : 1 to 2.4 cSt at 40°C
- : Not applicable
- : Not applicable

9.2. Other information

No information available

10. STABILITY AND REACTIVITY

10.1. Reactivity

No information available

10.2. Chemical stability

Stable under recommended handling and storage conditions

10.3. Possibility of hazardous reactions

None when treated according to provisions

10.4. Conditions to avoid

Avoid flammability hazards and potential ignition and heat sources (extremely high temperatures, heat sources, open flames, static electricity, sparks)

10.5. Incompatible materials

Strong oxidizing agents. Strong acids. Strong bases. Halogens.

10.6. Hazardous decomposition products

Does not decompose when used for intended uses.

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Basis of assessment: Information given is based on product data, knowledge of the components and the toxicology of similar products. The results are based on the available studies and support the classification.

Acute toxicity	Method	Species	Route of exposure	Effective dose	Exposure time	Results
·	Equiv. or similar to OECD 420	Rat (Sprague Dawley) male, female	Oral Gavage	5000mg/kg bw	single dose, 14days	LD50 >5000mg/kg bw
	Equiv. or similar to OECD 402	Rabbit (New Zealand White) male, female	Dermal Occlusive coverage	2000mg/kg bw	single dose, 24 hours to 10% of their body surface area	LD50 >2000mg/kg bw
	Equiv. or similar to OECD 403	Rat (Sprague- Dawley), male, female	Inhalation, Vapour, whole body	5.28 mg/L air	4 h	LC50 >5280 mg/m3 air
	Based on eval an acute oral,	uation of all the acu inhalation or derma	ute toxicity data dis al toxicant under th	scussed above, kerosine does no ne EU CLP Regulation (EC No. 12	ot meet the criteria 272/2008).	a for classification as
Skin Irritation	Method	Species	Route of exposure	Effective dose	Exposure time	Results
	Equivalent or similar to OECD 404	Rabbit (New Zealand white)	Skin	Semi-occlusive coverage (saved) to 0.5mL of kerosene Test material: odourless kerosine	4 h	Not -irritating
	EPA Guidelines in FR vol.44, No.145	N	w	Occlusive coverage (intact and abraded skin sites) to 0.5mL of kerosene Test material: kerosine/ heating oil	24 h	Irritating
	Based on the as defined by irritating to the	e overall weight of y EU CLP Regulat he skin.	f evidence of skii ion (EC No 1272	n irritation scores, kerosines 2/2008). They are classified	are classified as as Skin Irritant,	irritating to the skin Category 2 (H315),
Serious eve	Method	Species	Route of exposure	Effective dose	Exposure time	Results
damage/ irritation	EPA OTS 798:4500	New Zealand Rabbit, white	Еуе	0.1mL of was instilled in the conjunctival sac of the eye Test material: Kerosine, CAS No 68333-23-3	72 hours observation	Not irritating
	Based on a classification	lack of corneal, as an eye irritant	iridial, and cor as defined by E	njunctival irritation, kerosine U CLP Regulation.	es do not meet	the criteria for
Corrosivi	Method	Species	Route of	Effective dose	Exposure	Results
ty			exposure		time	
	No specific stu studies, no co	idies have been rep prrosive action of t	orted on corrosivit hese substances:	y of these substances in this cat is expected.	egory. Considerin	g the available
Respirato	Method	Species	Route of	Effective dose	Exposure	Results
ry or skin sensitisati on	Equiv. or similar to OECD 406	Guinea pig (Hartley), male	exposure Skin Induction and Challenge: epicutaneous, occlusive	Induction: 1:4 dilution Challenge: 1:4 dilution or 0.2% DNCB Test material: Kerosine , CAS No 68333-23-3	time	Not sensitizing

<u>Skin sensitisation</u>: Based on test data, kerosines do not meet the criteria for classification as a dermal sensitizer under EU CLP Regulation (EC No. 1272/2008). <u>Respiratory sensitization</u>: This endpoint is not a REACH requirement

Germ cell mutageni	Method	Species	Route of exposure	Effective dose	Exposure time	Results
city	IN VITRO Modified Ames assay Equiv. or similar to OECD 471	S.Typhimurium 98 S.Typhimurium TA 1535,1537, 1538, 98, 100 and S. Cerevisiae D4 (met. act. with and without		50 μl/ml Test material: CAS No 64742-81-0 and 8008-20 0.001-5.0 μl/plate Test material: CAS No 80 20-6)-6)08-	All in vitro assays were negative for genotoxicity, except for one assay done with straight run kerosine which was positive
	Equiv. or similar to OECD 476	Mouse lymphoma L5178Y cells (met. act. with and without)		-3.91-6.25 nl/ml (with activation) and 6.25-37.5 nl/ml (without activation) -0.004-0.065 nl/ml (with activation) and 0.006-0.1 nl/ml (without activation Test material: CAS No 80 20-6	5) L3)008-	
	IN VIVO Equiv. or similar to OECD 475	Rat (Sprague- Dawley), m, f	Intraperito neal	- 0, 0.3, 1.0, 3.0 g/kg Test material: CAS No 80 20-6 -0.3, 1.0, 3.0 g/kg Test material: CAS No 64742-81-0)08-	
	Ň	ŭ	ŭ	Sample1: 0.4, 0.13, 0.04 ml/rat Sample2: 0.18, 0.06, 0.0 ml/rat Test material: CAS No 80 20-6	2)08-	
	Equiv. or similar to OECD 478	Mouse (CD-1), male	Inhalation	Actual: 0, 98.4, 378.3 pp Test material: JF-A	m	All in vivo chromo- some aberration and dominant lethal assays were negative
	w	Mouse and rat, male	Intraperito neal	Mouse: 1ml/kg (diluted 10% in corn oil), Rat: undiluted Test material: Deodorize kerosine	d	for genotoxicity (OECD 475, 478), while one in vivo sister chromatid exchange assay (modified OECD 479)
	Equiv. or similar to OECD 479	Mouse (B6C3F1) male, female	w	400, 2000, 4000 mg/kg Test material: CAS No 64742-81-0		was positive for geno toxicity in male, but not in female mice.
	There were humans. Be and jet fuels that kerosing Regulation (no studies locate cause most studie were negative, t e and jet fuels an EC No. 1272/200	d that described es were negative he weight of evi e likely not muta 8).	mutagenic or genotoxic and the data on variou dence from in vitro and gens and are not classif	c effects of kerosii is individual comp in vivo mutagenio fied as mutagens	ne or jet fuels in onents of kerosines c studies indicates under the EU CLP
Carcino genicity	Method	Species	Route of exposure	Effective dose	Exposure time	Results

Equiv. or similar to OECD 451	Mouse (C3H/ HeNCrIBR), male	Dermal	37.5 µl Test material: JF-A	2 years, twice each week	Neoplastic effects: Yes
w	Mouse (C3H), male, female	w	25 mg Test material: JF-A	105 weeks, 3 times weekly	"
n	Mouse (C3H), male	n	50 µl Test material: CAS No 8008-20-6	24 months, twice weekly	w
W	Mouse (C3H/ HeJ), m,f	w	50 µl Test material: CAS No 64742-81-0	lifetime, twice per week	w
N	Mouse (B6C3F1), m,f	N	0, 250 or 500 mg/kg Test material: JP-5	103 w, except high dose- females were only exposed for 90 weeks (5 d/w)	w
n	Mouse (C3H), male	w	0, 28.5, 50, 100% Test material: CAS No 64742-81-0	2 years (low dose 7d/w, mild dose 4d/w, high dose 2d/w	w
w	W	w	50 gr/mouse Test material: CAS No 8008-20-6, 64742-47-8	2 years, twice per week	w

Kerosine is not carcinogenic when animals are exposed via the oral or inhalation route. However, chronic skin contact with kerosines and jet fuel may lead to tumour formation as a consequence of repeated cycles of irritation, skin damage and repair.

LOAEL: 200 mg/ kg bw/day - Target organs: other: skin

In studies where dermal irritation and/or inflammation were prevented, but other factors, such as dermal uptake of polycyclic aromatic compounds, were kept identical, no skin tumours were observed. Based on this data, kerosines are classified as non-carcinogenic according to the EU CLP Regulation (EC No.1272/2008).

Reprodu ctive and	Method	Species	Route of exposure	Effective dose	Exposure time	Results
develop mental toxicity	OECD Rat (Sprague- 421 Dawley), male, female	165(20%), 330 (40%) 494(60%) mg/kg/d. Different concentrations in solution and amount applied Test material: CAS No 64742-81-0	14 d premating to day 20 of gestation with males treated an additional week	NOAEL (P, reprod.toxicity): ≥494 mg/kg bw/day NOAEL (F1, develop. offsrpring toxicity): ≥494 mg/kg bw/day		
	No specific guidelines mentioned	Rat (Sprague- Dawley), male, female	Oral (gavage)	Males: 750, 1500,3000 mg/kg/d Females: 325, 750, 1500 mg/kg/d Test material: JP-8	Males: 70 to 90 days Females: 21 weeks	NOAEL (P): 750 mg/kg bw/day NOAEL (P, reprod.toxicity, male): ≥3000 mg/kg bw/day NOAEL (P, reprod.toxicity, female): ≥1500 mg/kg bw/day NOAEL (F1): 750 mg/kg bw/day

		Dat (Cara auto	0		10 devic	NOATI (ombrightsvicity)
	OECD 414	Rat (Sprague- Dawley)	Oral (gavage)	500, 1000, 1500, 2000 mg/kg/day (actually ingested) Test material: JP-8	10 days	NOAEL (embryotoxicity): 1000 mg /Kg bw/day LOAEL (embryotoxicity): 1500 mg /Kg bw/day NOAEL (maternal toxicity): 500 mg /Kg bw/day LOAEL (maternal toxicity):
	OECD 414	Rat (Sprague- Dawley)	Inhalation Whole body	106 or 364 ppm Test material: CAS No 8008-20-6	Six hours each day (daily) Days 6 through 15 of gestation	1000 mg /Kg bw/day NOAEC (maternal toxicity): ≥364ppm NOAEC (teratogenicity): ≥364ppm
	Kerosine NOAEL (NOAEL (NOAEL (All anima NOAEL (NOAEL ()))	does not cause (oral route): \geq 300 (dermal route): \geq (inhalation): \geq 10 al studies show t (oral route): 100 (dermal route): \geq (inhalation): \geq 30 there is insuffici (EC No. 1272/20 ental studies did the absence of si	fertility effects (0 00 mg/kg bw/day 494 mg/kg bw/day 00 mg/kg bw/day hat kerosine and 0 mg/kg bw/day 494 mg/kg bw/day 494 mg/kg bw/da 54 ppm ent data to classi 008). not provide suffic gns of marked m	DECD 421) ay jet fuel have no effect ay fy kerosines as toxic fo cient evidence to cause aternal toxicity, therefo	s on developn r reproductior a strong susp pre kerosines	nental (OECD 414) n under the EU CLP nicion of developmental are not classified as a
	developme		ording to EU CLP	Regulation (EC No. 12	72/2008).	
Specific	Method	Species	Route of	Effective	Exposure	Results
Target			exposure	dose	ume	
Organ Exposure (STOT) – repeated exposure	Equiv. or similar to OECD 412	Rat (Sprague- Dawley), male, female	Inhalation Subacute , Vapour, whole body	dose 24mg/m ³ (vapour) Test material: Kerosine, CAS No 64742-81-0	6h/d, 5d/w for 4w	NOAEC: ≥24 mg/m ³ air No treatment related effects observed
Organ Exposure (STOT) – repeated exposure	Equiv. or similar to OECD 412 Equiv. or similar to OECD 413	Rat (Sprague- Dawley), male, female Rat (Fischer 344), male, female	Inhalation Subacute , Vapour, whole body Inhalation Subchronic Vapour, whole body	aose24mg/m³(vapour) Test material: Kerosine, CAS No 64742-81-00, 500, 1000 mg/m³ (vapour)Test material: JP-8	6h/d, 5d/w for 4w 24h/d for 90 d	NOAEC: ≥24 mg/m ³ air No treatment related effects observed NOAEL: ≥1000mg/m ³ air LOAEL: 500 mg/m ³ (male, body and organ weights)
Organ Exposure (STOT) – repeated exposure	Equiv. or similar to OECD 412 Equiv. or similar to OECD 413	Rat (Sprague- Dawley), male, female Rat (Fischer 344), male, female Mouse (C57 BL) male,	ExposureInhalation Subacute , Vapour, whole bodyInhalation Subchronic Vapour, whole body	aose 24mg/m ³ (vapour) Test material: Kerosine, CAS No 64742-81-0 0, 500, 1000 mg/m ³ (vapour) Test material: JP-8 "	6h/d, 5d/w for 4w 24h/d for 90 d	NOAEC: ≥24 mg/m ³ air No treatment related effects observed NOAEL: ≥1000mg/m ³ air LOAEL: 500 mg/m ³ (male, body and organ weights)
Organ Exposure (STOT) – repeated exposure	Equiv. or Similar to OECD 412 Equiv. or Similar to OECD 413	Rat (Sprague- Dawley), male, female Rat (Fischer 344), male, female Mouse (C57 BL) male, female	Exposure Inhalation Subacute , Vapour, whole body Inhalation Subchronic Vapour, whole body	aose 24mg/m ³ (vapour) Test material: Kerosine, CAS No 64742-81-0 0, 500, 1000 mg/m ³ (vapour) Test material: JP-8 "	6h/d, 5d/w for 4w 24h/d for 90 d	NOAEC: \geq 24 mg/m ³ air No treatment related effects observed NOAEL: \geq 1000mg/m ³ air LOAEL: 500 mg/m ³ (male, body and organ weights) NOAEL: \geq 1000mg/m ³ air
Organ Exposure (STOT) – repeated exposure	Equiv. or Similar to OECD 412 Equiv. or Similar to OECD 413 ``	Rat (Sprague- Dawley), male, female Rat (Fischer 344), male, female Mouse (C57 BL) male, female Rat (Sprague- Dawley), male,	Exposure Inhalation Subacute , Vapour, whole body Inhalation Subchronic Vapour, whole body * Dermal Subacute	aose24mg/m³(vapour)Test material:Kerosine, CAS No64742-81-00, 500, 1000 mg/m³(vapour)Test material:JP-8"0.01, 0.05, 0.5 ml/kg/dTest material:	6h/d, 5d/w for 4w 24h/d for 90 d `` 6h/d, 5d/w for 4w	NOAEC: ≥24 mg/m ³ air No treatment related effects observed NOAEL: ≥1000mg/m ³ air LOAEL: 500 mg/m ³ (male, body and organ weights) NOAEL: ≥1000mg/m ³ air
Target Organ Exposure (STOT) – repeated exposure	Equiv. or Similar to OECD 412 Equiv. or Similar to OECD 413 `` OECD 410	Rat (Sprague- Dawley), male, female Rat (Fischer 344), male, female Mouse (C57 BL) male, female Rat (Sprague- Dawley), male, female Rat (Sprague-	Exposure Inhalation Subacute , Vapour, whole body Inhalation Subchronic Vapour, whole body * Dermal Subacute Oral	aose 24mg/m³(vapour) Test material: Kerosine, CAS No 64742-81-0 0, 500, 1000 mg/m³ (vapour) Test material: JP-8 " 0.01, 0.05, 0.5 ml/kg/d Test material: Kerosine, CAS No 68333-23-3 Males: 0, 750, 1500,	6h/d, 5d/w for 4w 24h/d for 90 d * 6h/d, 5d/w for 4w Males: 70	NOAEC: ≥24 mg/m ³ air No treatment related effects observed NOAEL: observed NOAEL: 500 mg/m ³ (male, body and organ weights) NOAEL: 20.5 ml/kgbw (male, female) NOAEL: 0.01 ml/kgbw (male, female) NOAEL: 750 mg/kgbw/d

1500 mg/kg/d

Test material: JP-8

21 w

(daily)

	 NOAEL (o NOAEL (d NOAEC (ir Based on th not classified 	ral): 750 mg /Kg ermal): ≥400 mg nhalation): ≥100 e lack of advers d for repeated do	bw /day g /Kg bw /day 0 mg /Kg bw /da e systemic effec ose toxicity unde	ay cts even with the highest r the EU CLP Regulation (B	doses administe EC No. 1272/2008	red, kerosines are 3).
STOT – single dose	Method	Species	Route of exposure	Effective dose	NOAEL	Exposure time
	Affected organs: Central Nervous System Route of exposure: Inhalation					
Aspiration Hazard	Due to low vomiting after	viscosity of ker er ingestion	osines aspiration	n is expected to occur o	nly during ingest	tion or in case of

12. ECOLOGICAL INFORMATION

Basis of assessment	Information given is based on a knowledge of the components and the ecotoxicology of similar products.
12.1. Toxicity	
Acute (short-term) Aquatic	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
toxicity: Fish	LL50 (96h): 2 to 5 mg/L, NOEL(96h): 2.0 mg/L (Oncorhynchus mykiss, OECD 203; KS = 1)
Aquatic invertebrates	EL50 (48h): 1.4 mg/L, NOEL(48h): 0.3 mg/L (Daphnia magna, OECD 202; KS = 1)
Chronic (long–term) Aquatic toxicity:	
Fish	NOEL: 0.098 mg/L (freshwater fish, PETROTOX computer model)
Aquatic invertebrates	NOEL (21d): 0.48 mg/L, LOEL (21d): 1,2 mg/L, EL50(21d): 0.89 mg/L (Daphnia magna, OECD 211; KS = 1)
Toxicity to aquatic algae:	NOEL (72h): 1.0 mg/L, EL50(72h): 1-3 mg/L (OECD 201; KS = 1)
Toxicity to microorganisms:	LL50(72h): 677.9mg/L (Tetrahymena pyriformis, PETROTOX computer model)
Sediment and terrestrial toxicity:	Substance is a hydrocarbon UVCB. Standard tests for this endpoint are intended for single substances and are not appropriate for the risk assessment of this complex substance
Toxicity to birds:	In accordance with Column 2 of REACH Annex X, studies on long- term or reproductive toxicity to birds studies do not need to be conducted due to the existence of a large mammalian dataset.

12.2. Persistence and degradability

Abiotic Degradation: Physical/photo-chemical

<u>Hydrolysis</u> Kerosines are resistant to hydrolysis because they lack a

elimination	functional group that is hydrolytically reactive. <u>Phototransformation in air:</u> Standard tests for atmospheric oxidation half-lives are intended for single substances and are not appropriate for this complex substance. <u>Phototransformation in water and soil:</u> The substance does not have the potential to undergo photolysis in water and soil.
Biodegradation:	Kerosines are not readily biodegradable, but as they can be degraded by micro-organisms, they are regarded as being inherently biodegradable.
12.3. Bio accumulative potential	
	The substance is a hydrocarbon UVCB. Standard tests for this endpoint are intended for single substances and are not appropriate for the risk assessment of this complex substance.
12.4. Mobility	
Known or predicted distribution to environmental compartments:	The distribution of the substance in the environmental compartments, air, water, soil, and sediment, has been calculated using the PETRORISK Model. Based on the regional scale exposure assessment, the multimedia distribution of the substance is 91.57 % to air, 1.54 % to water, 2.07 % to sediment and 4.82 % to soil.
Adsorption/Desorption:	The substance is a hydrocarbon UVCB. Standard tests for this endpoint are intended for single substances and are not appropriate for this complex substance.
12.5. Results of PBT and vPvB	assessment
	The substance is not considered to be PBT nor vPvB.
12.6. Other adverse effects	

No information available

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Recover if possible. Dispose of in accordance with the European Directives on waste and hazardous waste. The waste producer is responsible for determining the proper EWC code, classification of the waste and disposal methods, based on the application for which the product was used.
 13.1.1 Product / Packaging disposal:

13.1.2 Waste treatment-relevant information:	Empty containers may retain product residue including flammable or explosive vapours. Empty and drain the container thoroughly, including all internal piping, traps, and standpipes. Removal of flammable material from vessels and/or containers may be done by steaming out. Do not perform any work (welding, cutting, drilling,, soldering) on an "empty" container unless they have been cleaned and declared safe. Do not pollute the soil, water or environment with the waste container.
13.1.3 Sewage disposal-relevant information:	DON'T pour the substance down the drain, down the storm sewer or on the ground. Product should not be disposed of by release to sewers.
13.1.4 Other disposal recommendations:	Where possible (e.g. in the absence of relevant contamination), recycling of used substance is feasible and recommended. Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

Land Transport (ADR/RID) 14.1. UN No: 14.2. UN Proper Shipping Name: 14.3. Transport Hazard class: 14.4. Packing Group: 14.5. Environmental hazard:	UN 1863 FUEL, AVIATION, TURBINE ENGINE 3 Flammable liquids I or II or III The correct choice of packaging group, hazard identification number (HIN) and UK emergency action code (EAC) will depend upon the closed flash point and initial boiling point of the low boiling point of the liquid being transported. The criteria are published in the transport regulations, but are summarised below. Initial boiling point <=35°C requires packaging group I, HIN 33, UK EAC 3YE. Flash point (closed cup) <23°C and Initial boiling point >35°C requires packaging group II, HIN 33, UK EAC 3YE. Flash point (closed cup) >= 23 to <= 60°C and Initial boiling point >35°C requires packaging group III, HIN 30, UK EAC 3Y. For UN 1863 substances belonging to packing group II, the special provisions in ADR, RID and ADN(R) differ depending upon whether the vapour pressure of the substance at 50°C is more than 110 kPa or not more than 110 kPa. This product is classified as dangerous to the environment
Remarks:	Hazard identification number (HIN) 30 or 33. UK Emergency action code (EAC)
Inland waterways Transport (ADN) 14.1. UN No: 14.2. UN Proper Shipping Name: 14.3. Transport Hazard class: 14.4. Packing Group: 14.5. Environmental hazard:	UN1863 FUEL, AVIATION, TURBINE ENGINE 3 Flammable liquids I or II or III The correct choice of packaging group, hazard identification number (HIN) and UK emergency action code (EAC) will depend upon the closed flash point and initial boiling point of the low boiling point of the liquid being transported. The criteria are published in the transport regulations, but are summarised below. Initial boiling point <=35°C requires packaging group I, HIN 33, UK EAC 3YE. Flash point (closed cup) <23°C and Initial boiling point >35°C requires packaging group II, HIN 33, UK EAC 3YE. Flash point (closed cup) >= 23 to <= 60°C and Initial boiling point >35°C requires packaging group III, HIN 30, UK EAC 3Y. For UN 1863 substances belonging to packing group II, the special provisions in ADR, RID and ADN(R) differ depending upon whether the vapour pressure of the substance at 50°C is more than 110 kPa or not more than 110 kPa. This product is classified as dangerous to the environment
T-13. LINNI VIIIICIILAI IIAZAINI	This product is classified as daligerous to the chvironinicill

Remarks:	Substance transported by inland waterway in a tank vessel may have a different classification to substance being transported in packaging by inland waterway.
Sea transport (IMDG Code) 14.1. UN No:	UN 1863
14.2. UN Proper Shipping Name:	FUEL, AVIATION, TURBINE ENGINE
14.3. Transport Hazard class:	3 Flammable liquids
14.4. Packing Group:	The correct choice of packaging group, hazard identification number (HIN) and UK emergency action code (EAC) will depend upon the closed flash point and initial boiling point of the low boiling point naphtha being transported. The criteria are published in the transport regulations, but are summarised below. Initial boiling point <=35°C requires packaging group I, HIN 33, UK EAC 3YE. Flash point (closed cup) <23°C and Initial boiling point >35°C requires packaging group II, HIN 33, UK EAC 3YE. Flash point (closed cup) >= 23 to <= 60°C and Initial boiling point >35°C requires packaging group II, HIN 30, UK EAC 3YE. Flash point (closed cup) >= 23 to <= 60°C and Initial boiling point >35°C requires packaging group III, HIN 30, UK EAC 3Y. For UN 1863 substances belonging to packing group II, the special provisions in ADR, RID and ADN(R) differ depending upon whether the vapour pressure of the substance at 50°C is more than 110 kPa.
14.5. Environmental hazard:	Marine pollutant
Air Transport (IATA)	
14.1. UN NO: 14.2 UN Proper Shipping Name	UN 1863 FUEL AVIATION TURBINE ENGINE
14.3. Transport Hazard class:	3 Flammable liquids
14.4. Packing Group:	I or II or III The correct choice of packaging group, hazard identification number (HIN) and UK emergency action code (EAC) will depend upon the closed flash point and initial boiling point of the low boiling point of the liquid being transported. The criteria are published in the transport regulations, but are summarised below. Initial boiling point <=35°C requires packaging group I, HIN 33, UK EAC 3YE. Flash point (closed cup) <23°C and Initial boiling point >35°C requires packaging group II, HIN 33, UK EAC 3YE. Flash point (closed cup) >= 23 to <= 60°C and Initial boiling point >35°C requires packaging group III, HIN 30, UK EAC 3Y. For UN 1863 substances belonging to packing group II, the special provisions in ADR, RID and ADN(R) differ depending upon whether the vapour pressure of the substance at 50°C is more than 110 kPa or not more than 110 kPa.
14.5. Environmental hazard:	This product is classified as dangerous to the environment

14.6. Special precautions for user

Refer to Section 7, Handling and Storage

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

For bulk transport follow Annex II of MARPOL 73/78 and the IBC Code

15. REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulations

- Regulation (EC) No 1907/2006 of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC
- Regulation (EC) No 1272/2008 of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006
- Regulation (EC) No 453/2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
- Regulation (EC) No 830/2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

Authorisations and/or restrictions on use

- Authorisations: REACH Regulation Annex XIV List of substances subject to authorisation
- Restrictions on use: REACH Regulation Annex XVII Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Other EU regulations

- Directive 2008/98/EC of 19 November 2008 on waste and repealing certain Directives
- Directive 2012/18/EK of 4 July 2012 on the control of major accident hazards involving dangerous substances, amending and consequently repealing Directive 96/82/EC.
- Directive 2001/7/EC of 29 January 2001 adapting for the third time to technical progress Council Directive 94/55/EC on the approximation of the laws of the Member States with regard to the transport of dangerous goods by road
- Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental viability with regard to the prevention and remedying of environmental damage
- Directive 2004/37/EC of 29 April 2004 on the protection of workers from the risks related to exposure to carcinogens
 or mutagens at work.
- Directive 2009/161 establishing a third list of indicative exposure limit values in implementation of Directive 98/24/EK and amending Directive 2000/39/EK

National regulations

- Ministerial Decree 13588/725/2006 «Measures, terms and restrictions for handling hazardous wastes according to the Directive 91/689/EEC for hazardous waste» Replacement of the Ministerial Decree 19396/1546/1997 «Measures and terms for handling hazardous waste»
- Presidential Decree 307/1986 «Protection of Workers from the Risks Related to Exposure to Certain Chemical Agents at Work», as it has been amended by:
 - P.D. 77/1993 «Protection of workers from physical, chemical and biological agents at work and amendments and additions to P.D. 307/86 according to Directive 88/642/EEC»
 - P.D. 90/1999 «Establishment of exposure limit values and upper exposure limit values for workers exposed to certain chemical agents at work according to Directives 91/322/EEC and 96/94/EC and amendments and additions to P.D. 307/86, as it has been amended by P.D. 77/93»
 - P.D. 339/2001 «Amendments to P.D. 307/86 "Protection of workers from the risks related to exposure to certain chemical agents at work" »
 - P.D. 162/2007 «Protection of workers from the risks related to exposure to certain chemical agents at work, amending last version of P.D. 307/86 according to Directive 2006/15/EC»
 - P.D. 12/2012 «Amendments to P.D. 307/86 "Protection of workers from the risks related to exposure to certain chemical agents at work» according to Directive 2009/161/EU»
- Presidential Decree 395/1994, «Minimum Safety and Health Requirements for the Use of Work Equipment by Workers at Work (relevant to Directive 89/655/EEC)», as it has been amended by:
 - P.D. 89/99 «Amendments to P.D.395/94 according to Directive 95/63/EC»
 - P.D. 304/00 «Amendments to P.D.395/94, as it has been amended by P.D. 89/99»
 - P.D. 155/04 «Amendments to the last version of P.D.395/94 according to Directive 2001/45/EC»
- Presidential Decree 396/1994 "Minimum Health and Safety Requirements for the Use by Workers of Personal Protective Equipment at the Workplace (relevant to Directive 89/656/EEC)", as it has been amended
- Presidential Decree 338/2001 "Protection of the health and safety of workers from hazards caused by chemical agents at work"

• Ministerial Decision 34458/1990 "Technical specifications for the configuration, design, construction, safe operation and fire protection of refineries and other petroleum industries"

15.2. Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for this substance.

16. ABBREVIATIONS

Abbreviations, acro	onyms
CAS	Chemical Abstracts Service
DSD	Directive 67/548/EEC
CLP	Regulation 1272/2008
ADR	European Agreement concerning the International Carriage of Dangerous
	Goods by Road
ADN	European Agreement concerning the International Carriage of Dangerous
	Goods by Inland Waterway
IMDG	International Maritime Dangerous Goods Code
ICAO-TI	International Civil Aviation Organization-Technical Instructions
RID	Regulations concerning the International Carriage Dangerous Goods by
	Rail
DMEL	Derived Minimum Effect Level
DNEL	Derived No Effect Level
PNEC	Predicted No Effect Concentration
LOAEC	Lowest Observed Adverse Effect Concentration
LOAEL	Lowest Observed Adverse Effect Level
LOEL	Lowest Observed Effect Level
NOAEC	No Observed Adverse Effect Concentration
NOAEL	No Observed Adverse Effect Level
NOEC	No Observed Effect Concentration
NOEL	No Observed Effect Level
NOELR	No Observed Effect Loading Rate
LD50	Lethal Dose 50%
LC50	Lethal Concentration 50%
EL50	Effective Level 50%
ErL50	Effective Level 50% Reduction Growth Rate
LL50	Lethal Level 50%
PBT	Persistent, Bioaccumulative and Toxic
vPvB	very Persistent and very Bioaccumulative
SCC	Strictly Controlled Conditions
SCOEL	Scientific Committee on Occupational Exposure Limits
STOT	Specific Target Organ Toxicity
bw	Body weight
bw/day	Body weight/day
IARC	International Agency for Research on Cancer
	5,
References	
References	Chemical Safety Report
	(http://www.dauv.de/ifa/en/gestis/limit_values/index_isp)
Issue date	(http://www.uguvuc/na/ch/gcous/innic_vulucs/index.jsp/
Revision Date	15-12-2015
	Page 22 of 38

Reason for revision	Update due to new occupational exposure limit values from GESTIS (section 8) and to the repeal of Directives 67/548/EEC and 1999/45/EC (section 2 and 3)
Additional information	
Disclaimer	MOTOR OIL (HELLAS) -CORINTH REFINERIES specifies that the information given refers only to the specific product, and only when it is not used in combination with another product. The information is accurate according to the current state of knowledge and experience of the product at the date of last revision. MOTOR OIL (HELLAS) – CORINTH REFINERIES S.A. accepts no legal responsibility from any losses or damages caused by other uses, not described above, or from any incorrect use, handling, storage or purchase of the product. It is on the sole responsibility of the user to take all the necessary precautions for the safe use of the specific product. The information and guidelines of this document should be made available to all users. If further information is needed, please contact the company at the above telephone numbers or address.

EXPOSURE SCENARIOS

- ES 1: Manufacture of Kerosine Industrial
- ES 2: Distribution of Kerosine Industrial
- ES 3: Formulation & (Re)packing of Kerosine Industrial
- **ES 4:** Use of Kerosine as a Fuel Professional
- ES 5: Use of Kerosine as a Fuel Consumer

ES.1. Manufacture of Kerosine - Industrial

Section 1 Exposure Scenario Title Kerosine			
Title			
Manufacture of Substance			
Use Descriptor			
Sector(s) of Use		3, 8, 9	
Process Categories		1, 2, 3, 4, 8a, 8b, 15	
Environmental Release Categ	ories	1, 4	
Specific Environmental Relea	se Category	ESVOC SpERC 1.1.v1	
Processes, tasks, activitie	s covered		
Manufacture of the substance recovery, material transfers, loading (including marine ve	e or use as a proce storage, sampling, ssel/barge, road/ra	ess chemical or extraction agent. Includes recycling/ associated laboratory activities, maintenance and il car and bulk container).	
Assessment Method			
See Section 3.			
Section 2 Operational co	nditions and risk	management measures	
Section 2.1 Control of worker exposure			
Product characteristics			
Physical form of product	Liquid		
Vapour pressure (kPa)	Liquid, vapour pres	ssure 0.5-10 kPa at STP. OC4.	
Concentration of substance in product	Covers percentage differently) G13	e substance in the product up to 100 % (unless stated	
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2		
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented G1.		
Contributing Scenarios	Specific Risk Ma	nagement Measures and Operating Conditions	
General measures (skin irritants) G19	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent/ minimise exposures and to report any skin effects that may develop. E3		
CS15 General exposures (closed systems)	No other specific measures identified. EI20		
CS16 General exposures (open systems)	No other specific measures identified. EI20		
CS14 Bulk transfers	No other specific r	neasures identified. EI20	
CS2 Process sampling	No other specific r	neasures identified. EI20	
CS36 Laboratory activities	No other specific measures identified. EI20		

CS39 Equipment cleaning and maintenance	No other specific measures identified. EI20		
CS85 Bulk Product Storage	No other specific measures identified. EI20		
Section 2.2 Control of env	vironmental exposure		
Product characteristics			
Substance is complex UVCB [[PrC3]. Predominantly hydrophobic [PrC4a].		
Amounts used			
Fraction of EU tonnage used	in region	0.1	
Regional use tonnage (tonne	s/year)	5.4e6	
Fraction of Regional tonnage	e used locally	0.11	
Annual site tonnage (tonnes/	/year)	6.0e5	
Maximum daily site tonnage ((kg/day)	2.0e6	
Frequency and duration o	fuse		
Continuous release [FD2].			
Emission days (days/year)		300	
Environmental factors no	t influenced by risk management		
Local freshwater dilution factor 10			
Local marine water dilution factor 100		100	
Other given operational c	onditions affecting environmental expo	sure	
Release fraction to air from p	process (initial release prior to RMM)	1.0e-2	
Release fraction to wastewater from process (initial release prior to 3.0e-4		3.0e-4	
Release fraction to soil from process (initial release prior to RMM)		0.0001	
Technical conditions and	measures at process level (source) to p	revent release	
Common practices vary acros	ss sites thus conservative process release est	imates used [TCS1].	
Technical onsite condition and releases to soil	ns and measures to reduce or limit disch	arges, air emissions	
Risk from environmental exp	osure is driven by freshwater sediment [TCR	1b].	
Prevent discharge of undisso wastewater treatment requir	red [TCR13].	stewater [TRC14]. Onsite	
Treat air emission to provide	a typical removal efficiency of (%)	90	
Treat onsite wastewater (prior to receiving water discharge) to provide 97.7		97.7	
the required removal efficiency \geq (%)			
If discharging to domestic sewage treatment plant, provide the required 56.1 onsite wastewater removal efficiency of \geq (%)		56.1	
Organisation measures to	o prevent/limit release from site		
Do not apply industrial sludg reclaimed [OMS3].	e to natural soils [OMS2]. Sludge should be	incinerated, contained or	

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via domestic sewage treatment (%)	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	97.7
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	2.0e6
Assumed domestic sewage treatment plant flow (m3/d)	10000

Conditions and measures related to external treatment of waste for disposal

During manufacturing no waste of the substance is generated [ETW4].

Conditions and measures related to external recovery of waste

During manufacturing no waste of the substance is generated [ERW2].

Section 3 Exposure Estimation

3.1. Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

Section 4 Guidance to check compliance with the Exposure Scenario

4.1. Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterization. G37.

Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.

4.2. Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). [DSU4]. Scaled assessments for EU refineries have been performed using site-specific data and are attached in Petrorisk file in IUCLID Section 13-"Site-Specific Production" worksheet [DSU6].

ES.2. Distribution of Kerosine - Industrial

Section 1 Exposure Scenario Title Kerosine Title Distribution of Substance **Use Descriptor** Sector(s) of Use 1, 2, 3, 4, 8a, 8b, 9, 15 Process Categories Environmental Release Categories 1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7 ESVOC SpERC 1.1b.v1 Specific Environmental Release Category Processes, tasks, activities covered Bulk loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, maintenance and associated laboratory activities. **Assessment Method** See Section 3. Section 2 Operational conditions and risk management measures Section 2.1 Control of worker exposure Product characteristics Physical form of product Liquid Vapour pressure (kPa) Liquid, vapour pressure 0.5-10 kPa at STP. OC4. Concentration of substance Covers percentage substance in the product up to 100 % (unless stated in product differently) G13 Frequency and duration of Covers daily exposures up to 8 hours (unless stated differently) G2 use/exposure Other Operational Assumes use at not more than 20 °C above ambient temperatures, unless Conditions affecting stated differently G15. Assumes a good basic standard of occupational exposure hygiene is implemented G1. **Contributing Scenarios** Specific Risk Management Measures and Operating Conditions General measures (skin Avoid direct skin contact with product. Identify potential areas for indirect irritants) G19 skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent/ minimise exposures and to report any skin effects that may develop. E3 No other specific measures identified. EI20 CS15 General exposures (closed systems) CS16 General exposures No other specific measures identified. EI20 (open systems) CS2 Process sampling No other specific measures identified, EI20 CS36 Laboratory activities No other specific measures identified. EI20

CS14 Bulk transfers	No other specific measures identified. EI20	
CS6 Drum and small package filling		
CS39 Equipment cleaning and maintenance	No other specific measures identified. EI20	
CS85 Bulk Product Storage	No other specific measures identified. EI20	
Section 2.2 Control of env	vironmental exposure	
Product characteristics		
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used		
Fraction of EU tonnage used	in region	0.1
Regional use tonnage (tonnes	s/vear)	5.4e6
Fraction of Regional tonnage	used locally	2.0e-3
Annual site tonnage (tonnes/	(vear)	1.1e4
Maximum daily site tonnage ((kg/day)	3 6e4
Frequency and duration of	fuso	
requency and duration of	luse	
Continuous release [FD2].		
Emission days (days/year)		300
Environmental factors not	t influenced by risk management	
Local freshwater dilution fact	or	10
Local marine water dilution fa	actor	100
Other given operational c	onditions affecting environmental expo	sure
Release fraction to air from p	rocess (initial release prior to RMM)	1.0e-3
Release fraction to wastewater from process (initial release prior to RMM)		1.0e-5
Release fraction to soil from process (initial release prior to RMM) 0		0.00001
Technical conditions and	measures at process level (source) to p	revent release
Common practices vary acros	ss sites thus conservative process release est	imates used [TCS1].
Technical onsite condition and releases to soil	ns and measures to reduce or limit disch	arges, air emissions
Risk from environmental exp	osure is driven by freshwater [TCR1a].	
No wastewater treatment re	guired [TCR6].	
Treat air emission to provide	a typical removal efficiency of (%)	90
Treat onsite wastewater (prid the required removal efficien	or to receiving water discharge) to provide $(x) \ge (\%)$	0
If discharging to domestic se onsite wastewater removal e	wage treatment plant, provide the required fficiency of \geq (%)	0
Organisation measures to	prevent/limit release from site	
Do not apply industrial sludg reclaimed [OMS3].	e to natural soils [OMS2]. Sludge should be	incinerated, contained or

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via domestic sewage treatment (%)	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.7
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	2.6e6
Assumed domestic sewage treatment plant flow (m3/d)	2000

Conditions and measures related to external treatment of waste for disposal

External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].

Conditions and measures related to external recovery of waste

External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1].

Section 3 Exposure Estimation

3.1. Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].

Section 4 Guidance to check compliance with the Exposure Scenario

4.1. Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterization. G37.

Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.

4.2. Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). [DSU4].

ES.3. Formulation & (Re)packing of Kerosine - Industrial

Section 1 Exposure Scen	ario Title Kerosin	e		
Title				
Formulation & (Re)packing of Substances and Mixtures				
Use Descriptor				
Sector(s) of Use		3, 10		
Process Categories		1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15		
Environmental Release Categ	ories	2		
Specific Environmental Relea	ise Category	ESVOC SpERC 2.2.v1		
Processes, tasks, activitie	es covered			
Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, maintenance, sampling and associated laboratory activities.				
Assessment Method				
See Section 3.				
Section 2 Operational conditions and risk management measures				
Section 2.1 Control of worke	r exposure			
Product characteristics				
Physical form of product	Liquid			
Vapour pressure (kPa)	Liquid, vapour pres	ssure 0.5-10 kPa at STP. OC4.		
Concentration of substance in product	Covers percentage differently) G13	e substance in the product up to 100 % (unless stated		
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2			
Other Operational	Assumes use at no	ot more than 20 [°] C above ambient temperatures, unless		
Conditions affecting	stated differently	G15. Assumes a good basic standard of occupational		
exposure	hygiene is implem	ented G1.		
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions			
General measures (skin irritants) G19	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent/ minimise exposures and to report any skin effects that may develop. E3			
CS15 General exposures (closed systems)	No other specific measures identified. EI20			
CS16 General exposures (open systems)	No other specific measures identified. EI20			
CS2 Process sampling	No other specific r	neasures identified. EI20		
CS36 Laboratory activities	No other specific r	neasures identified. EI20		
CS14 Bulk transfers	No other specific measures identified. EI20			

CS30 Mixing operations (open systems)	No other specific measures identified. EI20			
CS34 Manual / CS22	CS34 Manual / CS22 No other specific measures identified. EI20			
Transfer from/pouring from containers				
CS8 Drum/batch transfers	No other specific measures identified. EI20			
CS100 Tabletting,	No other specific measures identified. EI20			
compression, extrusion or pelletisation				
CS6 Drum and small package filling	small No other specific measures identified. E120			
CS39 Equipment cleaning and maintenance	No other specific measures identified. EI20			
CS85 Bulk Product Storage	No other specific measures identified. EI20			
Section 2.2 Control of env	vironmental exposure			
Product characteristics				
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].			
Amounts used				
Fraction of EU tonnage used	in region	0.1		
Regional use tonnage (tonne	s/year)	5.2e6		
Fraction of Regional tonnage	5.8e-3			
Annual site tonnage (tonnes/year)		3.0e4		
Maximum daily site tonnage (kg/day)		1 0e5		
Frequency and duration of		1.005		
rrequency and duration o	il use			
Continuous release [FD2].				
Emission days (days/year)		300		
Environmental factors not influenced by risk management				
Local freshwater dilution factor 10				
Local marine water dilution fa	100			
Other given operational conditions affecting environmental exposure				
Release fraction to air from process (after typical onsite RMMs, consistent 1.0e-2 with EU Solvent Emissions Directive Requirements)				
Release fraction to wastewater from process (initial release prior to RMM)		2.0e-4		
Release fraction to soil from process (initial release prior to RMM)		0.0001		
Technical conditions and measures at process level (source) to prevent release				
Common practices vary across sites thus conservative process release estimates used [TCS1].				
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil				
Risk from environmental exposure is driven by freshwater sediment [TCR1b].				

Treat air emission to provide a typical removal efficiency of (%) 0 Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%) 86.0 Organisation measures to prevent/limit release from site 0 Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3]. 0 Conditions and measures related to municipal sewage treatment plant 94.7 Estimated substance removal from wastewater via domestic sewage treatment (%) 94.7 Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) 94.7 Maximum allowable site tonnage (Mark) based on release following total wastewater treatment removal (kg/d) 2.6e5 Assumed domestic sewage treatment plant flow (m3/d) 2000 Conditions and measures related to external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]. Conditions and measures related to external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations [ETW1]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate en	If discharging to domestic sewage treatment plant, no onsite wastewate	r treatment required [TCR9].
Treat on the porter of proceeding water discharge) to provide 86.0 the required removal efficiency ≥ (%) 86.0 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%) 0 Organisation measures to prevent/limit release from site 0 Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3]. 94.7 Conditions and measures related to municipal sewage treatment plant 94.7 Total efficiency of removal from wastewater via domestic sewage treatment plant (%) 94.7 Total efficiency of removal from wastewater after onsite and offsite (domestic sewage treatment plant RMNs (%) 2.6e5 Wasimum allowable site tornage (Mase) based on release following total wastewater treatment plant RMNs (%) 2000 Conditions and measures related to external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]. Conditions and measures related to external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calcula	Treat air emission to provide a typical removal efficiency of (%)	10
the required removal efficiency ≥ (%) If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%) Organisation measures to prevent/limit release from site Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3]. Conditions and measures related to municipal sewage treatment plant Estimated substance removal from wastewater via domestic sewage treatment (%) Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) R/Ms (%) Maximum allowable site tonnage (M _{sole}) based on release following total Assumed domestic sewage treatment plant flow (m3/d) Conditions and measures related to external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]. Conditions and measures related to external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	Treat onsite wastewater (prior to receiving water discharge) to provide	86.0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%) 0 Organisation measures to prevent/limit release from site 0 Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3]. Conditions and measures related to municipal sewage treatment plant Estimated substance removal from wastewater via domestic sewage treatment plant (%) 94.7 Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) NMMs (%) 94.7 Maximum allowable site tonnage (Mark) based on release following total wastewater treatment plant (kg/d) 2000 Conditions and measures related to external treatment of waste for disposal External treatment removal (kg/d) External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]. Conditions and measures related to external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	the required removal efficiency \geq (%)	
Organisation measures to prevent/limit release from site Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3]. Conditions and measures related to municipal sewage treatment plant Estimated substance removal from wastewater via domestic sewage y4.7 Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) 94.7 Maximum allowable site tonnage (Msete) based on release following total vastewater treatment removal (kg/d) 2.6e5 Assumed domestic sewage treatment plant flow (m3/d) 2000 Conditions and measures related to external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]. Conditions and measures related to external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%)	0
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3]. Conditions and measures related to municipal sewage treatment plant Estimated substance removal from wastewater via domestic sewage 94.7 Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) 94.7 Maximum allowable site tonnage (Msre) based on release following total vastewater treatment removal (kg/d) 2.6e5 Assumed domestic sewage treatment plant flow (m3/d) 2000 Conditions and measures related to external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]. Conditions and measures related to external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations [ETW3]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	Organisation measures to prevent/limit release from site	
Conditions and measures related to municipal sewage treatment plant Estimated substance removal from wastewater via domestic sewage treatment (%) Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) Maximum allowable site tonnage (Msree) based on release following total wastewater treatment removal (kg/d) Assumed domestic sewage treatment plant flow (m3/d) 2000 Conditions and measures related to external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]. Conditions and measures related to external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	Do not apply industrial sludge to natural soils [OMS2]. Sludge should be reclaimed [OMS3].	incinerated, contained or
Estimated substance removal from wastewater via domestic sewage 94.7 Total efficiency of removal from wastewater after onsite and offsite 94.7 (domestic treatment plant) RMMS (%) 94.7 Maximum allowable site tonnage (Msafe) based on release following total 2.6e5 wastewater treatment removal (kg/d) 2000 Conditions and measures related to external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]. Conditions and measures related to external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	Conditions and measures related to municipal sewage treatment	t plant
Estimated substance removal from wastewater via domestic sewage 94.7 Total efficiency of removal from wastewater after onsite and offsite 94.7 (domestic treatment plant) RMMs (%) 94.7 Maximum allowable site tonnage (Msere) based on release following total 2.6e5 wastewater treatment removal (kg/d) 2000 Conditions and measures related to external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]. Conditions and measures related to external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].		
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) 94.7 Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d) 2.6e5 Assumed domestic sewage treatment plant flow (m3/d) 2000 Conditions and measures related to external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]. Conditions and measures related to external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	Estimated substance removal from wastewater via domestic sewage treatment (%)	94.7
Maximum allowable site torinage (Made) based on release following total wastewater treatment removal (kg/d) 2.6e5 Assumed domestic sewage treatment plant flow (m3/d) 2000 Conditions and measures related to external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]. Conditions and measures related to external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2]. External exposure with the PETRORISK model [EE2].	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.7
Assumed domestic sewage treatment plant flow (m3/d) 2000 Conditions and measures related to external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]. Conditions and measures related to external recovery of waste External recovery and measures related to external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	2.6e5
Conditions and measures related to external treatment of waste for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]. Conditions and measures related to external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. S.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	Assumed domestic sewage treatment plant flow (m3/d)	2000
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3]. Conditions and measures related to external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	Conditions and measures related to external treatment of waste	for disposal
regulations [ETW3]. Conditions and measures related to external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	External treatment and disposal of waste should comply with applicable	local and/or national
Conditions and measures related to external recovery of waste External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	regulations [ETW3].	
External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	Conditions and measures related to external recovery of waste	
regulations [ERW1]. Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	External recovery and recycling of waste should comply with applicable le	ocal and/or national
Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	regulations [ERW1].	
Section 3 Exposure Estimation 3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].		
3.1. Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	Section 3 Exposure Estimation	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21. 3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	3.1. Health	
3.2. Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	The ECETOC TRA tool has been used to estimate workplace exposures un G21.	less otherwise indicated.
The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	3.2. Environment	
	The Hydrocarbon Block Method has been used to calculate environmental PETRORISK model [EE2].	l exposure with the
Section 4 Guidance to check compliance with the Exposure Scenario	Section 4 Guidance to check compliance with the Exposure Scen	ario
4.1. Health	4.1. Health	

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterization. G37.

Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.

4.2. Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). [DSU4].

ES.4. Use of Kerosine as a Fuel – Professional

Section 1 Exposure Scenario Title Kerosine				
Title				
Use as a Fuel				
Use Descriptor				
Sector(s) of Use		22		
Process Categories		1, 2, 3, 8a, 8b, 16		
Environmental Release Categories		9a, 9b		
Specific Environmental Release Category		ESVOC SpERC 9.12b.v1		
Processes, tasks, activities covered				
Covers the use as a fuel (or fuel additives and additive components) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.				
Assessment Method				
See Section 3.				
Section 2 Operational conditions and risk management measures				
Section 2.1 Control of wo	orker exposure			
Product characteristics				
Physical form of product	Liquid			
Vapour pressure (kPa)	Liquid, vapour pressure 0.5-10 kPa at STP. OC4.			
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13			
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2			
Other Operational	Assumes use at not more than 20° C above ambient temperatures, unless			
Conditions affecting	stated differently G15. Assumes a good basic standard of occupational			
exposure	hygiene is implemented G1.			
Contributing Scenarios	Specific Risk Ma	nagement Measures and Operating Conditions		
General measures (Skin irritants) G19	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin effects that may develop. E3			
CS15 General exposures (closed systems).	No other specific measures identified. EI20			
GEST_12I Use as a fuel. CS 107 (closed system)	No other specific measures identified. EI20			
CS14 Bulk transfers	No other specific measures identified. EI20			
CS22 Transfer from/ pouring from containers	No other specific measures identified. EI20			
CS39 Equipment cleaning and maintenance	No other specific measures identified. EI20			

CS85 Bulk Product	No other specific measures identified. EI20			
itorage				
Section 2.2 Control of environmental exposure				
Product characteristics				
Substance is complex UVCB	[PrC3]. Predominantly hydrophobic [PrC4a].			
Amounts used				
Fraction of EU tonnage used	0.1			
Regional use tonnage (tonne	4.4e6			
Fraction of Regional tonnage	5.0e-4			
Annual site tonnage (tonnes,	2.2e3			
Maximum daily site tonnage	6.1e3			
Frequency and duration o	of use			
Continuous release [FD2].				
Emission days (days/year)	365			
Environmental factors no	t influenced by risk management			
Local freshwater dilution fac	10			
Local marine water dilution f	actor	100		
Release fraction to air from v	wide dispersive use (regional only)	1.0e-3		
Release fraction to wastewa	0.00001			
Release fraction to soil from	0.00001			
Technical conditions and	measures at process level (source) to p	revent release		
Common practices vary across sites thus conservative process release estimates used [TCS1].				
Technical onsite conditio and releases to soil	ns and measures to reduce or limit disch	narges, air emissions		
Risk from environmental exp No wastewater treatment re	posure is driven by freshwater [TCR1a]. equired [TCR6].			
Treat air emission to provide	N/A			
Treat onsite wastewater (pri the required removal efficier	0			
If discharging to domestic se onsite wastewater removal e	0			
Organisation measures to	o prevent/limit release from site			
Do not apply industrial sludg reclaimed [OMS3].	ge to natural soils [OMS2]. Sludge should be	incinerated, contained or		
Conditions and measures related to municipal sewage treatment plant				
Estimated substance remova treatment (%)	94.7			
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.7			
--	-------			
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	6.9e5			
Assumed domestic sewage treatment plant flow (m ³ /d)	2000			

Conditions and measures related to external treatment of waste for disposal

Combustion emissions limited by required exhaust emission controls [ETW1]. Combustion emissions considered in regional exposure assessment [ETW2].

Conditions and measures related to external recovery of waste

This substance is consumed during use and no waste of the substance is generated [ERW3].

Section 3 Exposure Estimation

3.1. Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated G21.

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].

Section 4 Guidance to check compliance with the Exposure Scenario

4.1. Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterisation. G37.

Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.

4.2. Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). [DSU4].

ES.5. Use of Kerosine as a Fuel - Consumer

Section 1 Exposure Scena	rio Title Ke	rosine		
Title				
Use as a Fuel				
Use Descriptor				
Sector(s) of Use		21		
Product Categories		13		
Environmental Release Catego	ories	9a, 9b		
Specific Environmental Releas	e Category	ESVOC SpERC9.12c.v1		
Processes, tasks, activities	covered			
Covers consumer uses in fuels				
Assessment Method				
See Section 3.				
Section 2 Operational conditions and risk management measures				
-		-		
Section 2.1 Control of cons	sumer expo	sure		
Product characteristics				
Physical form of product		liquid		
Vapour pressure		Liguid, vapour pr	essure > 10 Pa (STP)[OC15]	
Concentration of substance in product		Unless otherwise stated, covers concentrations up to 100%		
		[ConsOC1]		
		Unless otherwise	Unless otherwise stated, covers use amounts up to 50000g	
Amounts used		[ConsOC2]; cove	[ConsOC2]; covers skin contact area up to 420cm ²	
		[ConsOC5]		
		Unless otherwise stated, covers use frequency up to 0.143		
Frequency and duration of use	e/exposure	times per day [ConsOC4]; covers exposure up to 2 hours		
		per event [ConsOC1 4]		
Other Operational Conditions affecting exposure		Unless otherwise stated, assumes use at ambient		
		temperatures [ConsOC15]; assumes use in a 20 m ³ room		
		[ConsOC11]; assumes use with typical ventilation		
Product Category		Specific Risk Management Measures and Operating Conditions		
		Unless otherwise stated, covers concentrations up to 100%		
		[ConsOC1]: covers use up to 52 days/year [ConsOC3]:		
PC13: Fuels-Liquid -: Refueling		covers use up to 1 time/on day of use[ConsOC4]: covers		
		skin contact area up to 210,00 cm ² [ConsOC5]; for each		
	OC	use event, covers use amounts up to 50000g [ConsOC2];		
		covers outdoor use [ConsOC12]; covers use in room size of		
		100m ³ [ConsOC11]; for each use event, covers exposure		
		up to 0.05hr/ever	up to 0.05hr/event [ConsOC14];	
	RMM	No specific RMMs	developed beyond those OCs stated	
Section 2.2 Control of envi	ronmental	exposure		
Product characteristics				
Substance is complex UVCB [P	rC3]. Predon	ninantly hydrophol	pic [PrC4a].	
Amounts used				
Fraction of EU tonnage used in region		0.1		
Regional use tonnage (tonnes/year)		1.8e5		
Fraction of Regional tonnage used locally		0.0005		
Annual site tonnage (tonnes/year)		89		
Maximum daily site tonnage (k	g/day)		245	
Frequency and duration of	use			

Continuous release [ED2].				
Emission days (days/year)	365			
Environmental factors not influenced by risk managen	nent			
Local freshwater dilution factor	10			
Local marine water dilution factor	100			
Other given operational conditions affecting environm	iental exposure			
	•			
Release fraction to air from wide dispersive use (regional only)	1.0e-3			
Release fraction to wastewater from wide dispersive use	0.00001			
Release fraction to soil from wide dispersive use (regional	0.00001			
Conditions and measures related to municipal sewage treatment plant				
Risk from environmental exposure is driven by freshwater [S	TP7a]			
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.7			
Maximum allowable site tonnage (M _{Safe}) based on release following total wastewater treatment removal (kg/d)	3.1e4			
Assumed domestic sewage treatment plant flow (m ³ /d)	2000			
Conditions and measures related to external treatment	nt of waste for disposal			
Combustion emissions limited by required exhaust emission considered in regional exposure assessment [ETW2].	ontrols [ETW1]. Combustion emissions			
Conditions and measures related to external recovery	of waste			
This substance is consumed during use and no waste of the substance is generated [ERW3].				
Costion 2 Francesus Estimation				
Section 3 Exposure Estimation				
The ECETOC TDA tool has been used to estimate consumer	avpagurage consistant with the contant of			
The ECETOC TRA tool has been used to estimate consumer exposures, consistent with the content of				
these sources then they are indicated				
3.2. Environment				
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [FE2]				
Section 4 Guidance to check compliance with the Exp	osure Scenario			
4.1. Health				
Predicted exposures are not expected to exceed the applicable consumer reference values when the				
operational conditions/risk management measures given in Section 2 are implemented. G39.				
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure				
that risks are managed to at least equivalent levels. G23.				
4.2. Environment				
Guidance is based on assumed operating conditions which m scaling may be necessary to define appropriate site-specific Further details on scaling and control technologies are provided	nay not be applicable to all sites; thus, risk management measures [DSU1]. led in SpERC factsheet			
(http://cofic.org/on/roach_for_inductrice_librariae_html) [DCU	۰. ۱			