Material Safety Sheets

Mineral Mountain Project

Material Safety Data Sheet

Quadra

DANAFLOAT™ 233

WHMIS	Protective Clothing	TDG
		

1 . Product and company identification

Product name : DANAFLOAT™ 233

Supplier : QUADRA CHEMICALS LTD.
3901 F.X. Tessier
Vaudreuil-Dorion, Quebec
Canada J7V 5V5
Tel: 1-800-665-6553

Material uses : Mining industry: Flotation reagent (flotation collector).

Code : Q05027

Validation date : 9/26/2016.

Responsible name : Regulatory Affairs / Affaires réglementaires

In case of emergency : **TRANSPORTATION EMERGENCY - 24HRS/DAY - 7 DAYS/WEEK**
IN CANADA - CALL 1-800-567-7455

2 . Hazards identification

Physical state : Liquid.

Odor : Characteristic. Sulfurous.

Emergency overview : DANGER!

CAUSES RESPIRATORY TRACT, DIGESTIVE TRACT, EYE AND SKIN BURNS.

Corrosive to the eyes, skin, respiratory system and digestive tract. Causes burns. Do not breathe vapor or mist. Do not ingest. Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

Routes of entry : Inhalation. Ingestion.

Potential acute health effects

Inhalation : Corrosive to the respiratory system.

Ingestion : Corrosive to the digestive tract. Causes burns.

Skin : Corrosive to the skin. Causes burns.

Eyes : Corrosive to eyes. Causes burns.

Potential chronic health effects

Chronic effects : No known significant effects or critical hazards.

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.

Target organs : Not available.

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing

Ingestion : Adverse symptoms may include the following:
stomach pains

2 . Hazards identification

Skin : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Eyes : Adverse symptoms may include the following:
pain
watering
redness

Medical conditions aggravated by over-exposure : None known.

See toxicological information (section 11)

3 . Composition/information on ingredients

Name	CAS number	%
phosphorodithioic acid, O,O-bis(1-methylethyl) ester, sodium salt	27205-99-8	30 - 60
sodium hydroxide	1310-73-2	1 - 5

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.

4 . First aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : 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.

5 . Fire-fighting measures

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
sulfur oxides
phosphorus oxides
metal oxide/oxides
hydrogen sulfide

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

Personal precautions : 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. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

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 for cleaning up

Spill or leak : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Keep away from acids. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : 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 and food and drink. Separate from acids. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Store above 0°C. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Product name	Exposure limits
sodium hydroxide	**ACGIH TLV (United States).** CEIL: 2 mg/m³

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

8 . Exposure controls/personal protection

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. Recommended: splash goggles

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Recommended: chemical-resistant protective suit

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

Physical state : Liquid.

Color : Brown. [Light]

Odor : Characteristic. Sulfurous.

pH : 12 to 14

Boiling/condensation point : 105°C (221°F)

Melting/freezing point : -4°C (24.8°F)

Solubility : Soluble in the following materials: cold water.

Density : 1.16 g/cm^3 [20°C (68°F)]

10 . Stability and reactivity

Stability : The product is stable.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to avoid : No specific data.

Materials to avoid : acids

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
DANAFLOAT™ 233	LD50 Dermal	Rat	>2000 mg/kg	-
	LD50 Oral	Rat	>2000 mg/kg	-
sodium hydroxide	LD50 Dermal	Rabbit	1350 mg/kg	-
	LDLo Oral	Rabbit	500 mg/kg	-

Conclusion/Summary : No additional information.

12 . Ecological information

Environmental effects : Bioaccumulation is not expected. The product is biodegradable.

Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
sodium hydroxide	-	Acute LC50 33 to 100 mg/L	Fish	48 hours

Conclusion/Summary : Not available.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. 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. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Waste and empty packaging must be disposed of in accordance with federal, provincial, and municipal environmental control regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
TDG Classification	1719	CAUSTIC ALKALI LIQUID, N.O.S. (phosphorodithioic acid, O,O-bis(1-methylethyl) ester, sodium salt, sodium hydroxide)	8	III		-

PG* : Packing group

15 . Regulatory information

WHMIS (Canada) : Class E: Corrosive material

Canada inventory : All ingredients are listed or exempted.

16 . Other information

Additional information : **This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.**

Other special considerations : No additional remark.

Regulatory Affairs Department : 1 800 665-6553

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

with applicable law. You should obtain and review the applicable Material Safety Data Sheet information before handling any of these products. For additional information, please contact Clariant.

US / EN

SECTION 1. IDENTIFICATION

Identification of the company:	Clariant Corporation 4000 Monroe Road Charlotte, NC, 28205 Telephone No.: +1 704 331 7000 **Information of the substance/preparation:** Product Stewardship, +1-704-331-7710 **Emergency tel. number:** +1 800-424-9300 CHEMTREC

Trade name: **EF NA 077/20**
Material number: 109498

Primary product use: Collecting agent for flotation

Chemical family: aqueous solution of mercaptobenzthiazol - sodium and sodium - di-sec.-butyldithiophosphate

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin irritation : Category 2

Serious eye damage : Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H315 Causes skin irritation.
H318 Causes serious eye damage.

Precautionary statements :

Prevention:

P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/ eye protection/ face protection.

Response:

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.

P332 + P313 If skin irritation occurs: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.

Additional Labelling

The following percentage of the mixture consists of ingredient(s) with unknown acute toxicity: 10.2276 %

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
Benzothiazole-2-thiol	149-30-4	20 - 30
Sodium hydroxide	1310-73-2	5 - 10

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

SECTION 4. FIRST AID MEASURES

General advice : Remove/ Take off immediately all contaminated clothing.

If inhaled : Remove person to fresh air. If signs/symptoms continue, get medical attention.

In case of skin contact : Wash off immediately with plenty of water.
Consult a physician.

In case of eye contact : Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

If swallowed : If swallowed, rinse mouth with water (only if the person is conscious).
Get medical advice/ attention.

If swallowed, seek medical advice immediately and show this container or label.
Do NOT induce vomiting.

Most important symptoms and effects, both acute and delayed : No symptoms known currently.
No hazards known at this time.

Notes to physician : Treat symptomatically.

Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Observe national and local legal requirements
Avoid contact with skin, eyes and clothing.
Do not ingest.

Revision Date : 09/17/2020

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Sodium hydroxide	1310-73-2	1000	*

*: Calculated RQ exceeds reasonably attainable upper limit.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Skin corrosion or irritation
Serious eye damage or eye irritation

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Benzothiazole-2-thiol 149-30-4 >= 20 - < 30 %

Clean Water Act

Contains no known priority pollutants at concentrations greater than 0.1%.

The components of this product are reported in the following inventories:

TSCA : All components are compliant with the TSCA Inventory Notification (Active) rule.

SECTION 16. OTHER INFORMATION

Further information

Full text of other abbreviations

ACGIH : USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL : USA. NIOSH Recommended Exposure Limits
OSHA P0 : USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
OSHA Z-1 : USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
US WEEL : USA. Workplace Environmental Exposure Levels (WEEL)
ACGIH / C : Ceiling limit
NIOSH REL / C : Ceiling value not be exceeded at any time.
OSHA P0 / C : Ceiling limit
OSHA Z-1 / TWA : 8-hour time weighted average
US WEEL / TWA : 8-hr TWA

AICS - Australian Inventory of Chemical Substances; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA -

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Water spray jet
Alcohol-resistant foam
Dry powder
Carbon dioxide (CO2)

Unsuitable extinguishing media : High volume water jet

Specific hazards during firefighting : In case of fire hazardous decomposition products may be produced such as:

Sulphur dioxide

Further information : In the event of fire and/or explosion do not breathe fumes.
Do not allow run-off from fire fighting to enter drains or water courses.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Special protective equipment for firefighters : Wear an approved positive pressure self-contained breathing apparatus in addition to standard fire fighting gear.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Wear suitable protective equipment.
Ensure adequate ventilation.
Wearing appropriate personal protective equipment, contain spill, collect onto inert absorbent, and place in a suitable container.
Prevent from entering into soil, ditches, sewers, waterways and/or groundwater.

Environmental precautions : Do not allow to enter drains or waterways

Methods and materials for containment and cleaning up : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion : Observe the general rules of industrial fire protection

Advice on safe handling : Use only with adequate ventilation and proper protective eyewear, gloves, and clothing.

Avoid breathing vapours.
Avoid contact with skin, eyes and clothing.
Wash thoroughly after handling.

Handle and open container with care.

Further information on storage conditions : Store in original container.
Store in a cool, well-ventilated area.
Keep container closed.

Keep only in the original container, tightly closed, in a well ventilated place
- sensitive to frost - In case of the product becoming opaque, thickening or being frozen due to the effects of cold, allow to thaw slowly at room temperature. Stir briefly before use.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Benzothiazole-2-thiol	149-30-4	TWA	5 mg/m3	US WEEL
Sodium hydroxide	1310-73-2	C	2 mg/m3	ACGIH
		C	2 mg/m3	NIOSH REL
		TWA	2 mg/m3	OSHA Z-1
		C	2 mg/m3	OSHA P0

Engineering measures : Local ventilation recommended - mechanical ventilation may be used.

Personal protective equipment

Respiratory protection : If airborne concentrations pose a health hazard, become irritating, or exceed recommended limits, use a NIOSH approved respirator in accordance with OSHA respiratory protection requirements under 29CFR1910.134.

Hand protection
Remarks : Chemical resistant gloves

Eye protection : Safety glasses
Safety goggles or full face shield to protect against splashes.

Skin and body protection : Wear suitable protective clothing.

Protective measures : Avoid contact with skin and eyes.

Hygiene measures : Wash hands before breaks and at the end of workday.
Use protective skin cream before handling the product.
Take off immediately all contaminated clothing and wash it before reuse.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

RCRA - Resource Conservation and Recovery Authorization Act : No -- Not as sold.

Waste from residues : Consult local, state, and federal regulations.

Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities.

Contaminated packaging : Packaging that cannot be cleaned should be disposed of as product waste

SECTION 14. TRANSPORT INFORMATION

DOT Regulation:
UN/NA-number: UN 3267
Proper shipping name: Corrosive liquid, basic, organic, n.o.s.
Technical Name: Sodium-2-Mercaptobenzothiazole
Sodium hydroxide

Primary hazard class: 8
Packing group: II
Reportable Quantity: 11,339.000 kg Sodium hydroxide

IATA
UN/ID number: UN 3267
Proper shipping name: Corrosive liquid, basic, organic, n.o.s.
Hazard inducer(s): Sodium-2-Mercaptobenzothiazole
Sodium hydroxide

Primary risk: 8
Packing group: II
Remarks: Shipment permitted

IMDG
UN no.: UN 3267
Proper shipping name: Corrosive liquid, basic, organic, n.o.s.
Hazard inducer(s): Sodium-2-Mercaptobenzothiazole
Sodium hydroxide
Hazard inducer / Marine pollutant: Sodium-2-Mercaptobenzothiazole

Primary risk: 8
Packing group: II
Marine pollutant: Marine Pollutant
EmS: F-A S-B

Bioaccumulative potential

Product:

Bioaccumulation : Remarks: no data available

Components:

Benzothiazole-2-thiol:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 0.8 - 8
Exposure time: 42 d
Concentration: < 0.01 - 0.1 mg/l
Method: OECD Test Guideline 305C
GLP: No information available.

Mobility in soil

Product:

Distribution among environmental compartments : Remarks: no data available

Components:

Benzothiazole-2-thiol:

Distribution among environmental compartments : Adsorption/Soil
Medium: water - soil
log Koc: 2.51 - 3.55
Method: Other
Remarks: Slightly mobile in soils

Other adverse effects

Product:

Additional ecological information : no data available

Components:

Benzothiazole-2-thiol:

Environmental fate and pathways : not available

Results of PBT and vPvB assessment : This substance is not considered to be persistent, bioaccumulating and toxic (PBT).

Additional ecological information : The product should not be allowed to enter drains, water courses or the soil.

Sodium hydroxide:

Results of PBT and vPvB assessment : Remarks: Not applicable

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Liquid
Colour	:	yellow to brown
Odour	:	foul-smelling
Odour Threshold	:	not tested.
pH	:	approx. 11 (68 °F / 20 °C) Concentration: 10 g/l
pour point	:	approx. 27 °F / -3 °C Method: ISO 3016
Boiling point	:	approx. 214 °F / 101 °C
Flash point	:	Not applicable
Evaporation rate	:	Not applicable
Self-ignition	:	Not applicable
Burning number	:	Not applicable
Upper explosion limit / upper flammability limit	:	Not applicable
Lower explosion limit / Lower flammability limit	:	Not applicable
Vapour pressure	:	Not applicable
Relative vapour density	:	Not applicable
Density	:	approx. 1.14 g/cm3 (68 °F / 20 °C) Method: DIN 51757
Bulk density	:	Not applicable
Solubility(ies)		
Water solubility	:	soluble (68 °F / 20 °C)
Solubility in other solvents	:	not tested. Solvent: fat

Partition coefficient: n-octanol/water	:	not tested.
Auto-ignition temperature	:	Not applicable
Decomposition temperature	:	>= 266 °F / 130 °C Method: DTA
Viscosity		
Viscosity, dynamic	:	approx. 10 mPa.s (68 °F / 20 °C)
Viscosity, kinematic	:	not tested.
Explosive properties	:	no data available
Oxidizing properties	:	Not applicable
Minimum ignition energy	:	not tested.
Particle size	:	Not applicable

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	:	No dangerous reaction known under conditions of normal use. Stable
Conditions to avoid	:	None known.
Incompatible materials	:	not known
Hazardous decomposition products	:	Hydrogen sulfide (H2S)

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Eye contact
Skin contact
Inhalation
Ingestion
Skin Absorption

Acute toxicity

Product:

Acute oral toxicity	:	LD50 (Rat): > 2,000 mg/kg Method: OECD Test Guideline 401

Persistence and degradability

Product:

Biodegradability	:	Biodegradation: 10 - 35 % Method: OECD Test Guideline 302B
Chemical Oxygen Demand (COD)	:	605 mg/g
Dissolved organic carbon (DOC)	:	145 mg/g

Components:

Benzothiazole-2-thiol:

Biodegradability	:	aerobic Inoculum: other bacteria Concentration: 100 mg/l Biochemical Oxygen Demand (BOD) Result: Not readily biodegradable. Biodegradation: ca. 2.5 % Exposure time: 14 d Method: OECD Test Guideline 301C GLP: No information available.
Stability in water	:	Test Type: abiotic Hydrolysis: ca. (0 %) Method: OECD Test Guideline 111 GLP: yes
Photodegradation	:	Test Type: air Light source: Sunlight Sensitiser: OH Rate constant: 4.06 *10-11cm3/(molecule*sec). Degradation (indirect photolysis): 50 % Degradation half life: 9.5 h Method: calculated GLP: no Test Type: water Light source: Sunlight Degradation (direct photolysis): 86 % Degradation (indirect photolysis): 91 % Method: other (measured) GLP: yes

Sodium hydroxide:

Biodegradability	:	Remarks: The methods for determining biodegradability are not applicable to inorganic substances.
Biochemical Oxygen Demand (BOD)	:	Remarks: Not applicable

GLP: yes

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.08 mg/l
End point: Reproduction rate
Exposure time: 21 d
Analytical monitoring: no data available
Method: OECD Test Guideline 211
GLP: yes

M-Factor (Chronic aquatic toxicity) : 1

Toxicity to microorganisms : EC50 (activated sludge): 3,301 mg/l
End point: Bacteria toxicity (respiration inhibition)
Exposure time: 3 h
Test Type: aquatic
Analytical monitoring: no
Method: OECD Test Guideline 209
GLP: no
Remarks: The details of the toxic effect relate to the nominal concentration.

Toxicity to soil dwelling organisms : Remarks: Not applicable

Plant toxicity : Remarks: Not applicable

Sediment toxicity : Remarks: Not applicable

Toxicity to terrestrial organisms : Remarks: Not applicable

Sodium hydroxide:

Toxicity to fish : Remarks: Not classified due to inconclusive data.

Toxicity to daphnia and other aquatic invertebrates : EC50 (Ceriodaphnia spec.): 40,4 mg/l
End point: Immobilization
Exposure time: 48 h
Analytical monitoring: no
Method: Other
GLP: no

Toxicity to algae/aquatic plants : Remarks: no data available

Toxicity to fish (Chronic toxicity) : Remarks: no data available

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : Remarks: no data available

Acute inhalation toxicity : Remarks: no data available

Acute dermal toxicity : Remarks: no data available

Components:

Benzothiazole-2-thiol:

Acute oral toxicity : LD50 (Rat, male and female): 3,800 mg/kg
Method: Other
GLP: no

Acute inhalation toxicity : LC50 (Rat, male and female): > 1.27 mg/l
Exposure time: 4 h
Method: Other
GLP: no

Acute dermal toxicity : LD50 (Rabbit, male and female): > 7,940 mg/kg
Method: Other
GLP: no

Sodium hydroxide:

Acute oral toxicity : Remarks: Not relevant

Acute inhalation toxicity : Remarks: Not relevant

Acute dermal toxicity : Remarks: Not relevant

Skin corrosion/irritation

Product:

Species: Rabbit
Method: OECD Test Guideline 404
Result: strongly corrosive

Components:

Benzothiazole-2-thiol:

Species: Rabbit
Exposure time: 24 h
Method: Other
Result: No skin irritation
GLP: no

Sodium hydroxide:

Species: In Vitro Membrane Barrier Test Method for Skin Corrosion - CORROSITEX
Method: OECD Test Guideline 435
Result: Causes severe burns.
GLP: no data available

Serious eye damage/eye irritation

Product:

Remarks: no data available

Components:

Benzothiazole-2-thiol:

Species: rabbit eye
Result: No eye irritation
Exposure time: 24 h
Method: Other
GLP: no

Sodium hydroxide:

Species: Rabbit
Result: Risk of serious damage to eyes.
Method: OECD Test Guideline 405
GLP: no

Respiratory or skin sensitisation

Product:

Remarks: no data available

Components:

Benzothiazole-2-thiol:

Test Type: Guinea pig maximization test
Exposure routes: Skin contact
Species: Guinea pig
Method: OECD Test Guideline 406
Result: Causes sensitisation.
GLP: yes

Sodium hydroxide:

Test Type: Patch Test 24 Hrs.
Exposure routes: Dermal
Species: Humans
Method: Other
Result: Not a skin sensitizer.
GLP: no

Germ cell mutagenicity

Product:

Germ cell mutagenicity - Assessment : No information available.

General Information : Respiratory system
Respiratory disorders

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish : LC50 (Leuciscus idus (Golden orfe)): 10 - 100 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : Remarks: no data available

Toxicity to algae/aquatic plants : Remarks: no data available

Toxicity to microorganisms : Remarks: no data available

Components:

Benzothiazole-2-thiol:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 0.73 mg/l
Exposure time: 96 h
Test Type: flow-through test
Analytical monitoring: yes
Method: OECD Test Guideline 203
GLP: No information available.

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 0.71 mg/l
Exposure time: 48 h
Analytical monitoring: no data available
Method: OECD Test Guideline 202
GLP: yes

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): 0.5 mg/l
End point: Growth rate
Exposure time: 72 h
Analytical monitoring: no data available
Method: OECD Test Guideline 201
GLP: yes

M-Factor (Acute aquatic toxicity) : 1

Toxicity to fish (Chronic toxicity) : NOEC (Oncorhynchus mykiss (rainbow trout)): 0.041 mg/l
End point: Other
Exposure time: 89 d
Test Type: flow-through test
Analytical monitoring: yes
Method: OECD Test Guideline 210

LOAEL: 124 - 438 mg/kg
Application Route: oral (feed)
Exposure time: >= 70 d
Number of exposures: daily
Dose: 2500-8750-15000 ppm in diet
Group: yes
Method: Repeated Dose Toxicity (subchronic study)
GLP: yes

Application Route: Inhalation
Remarks: This information is not available.

Application Route: Skin contact
Remarks: This information is not available.

Sodium hydroxide:

Application Route: Oral
Method: Repeated dose toxicity
Remarks: The study is not necessary from a scientific perspective.

Application Route: Inhalation
Method: Repeated dose toxicity
Remarks: The study is not necessary from a scientific perspective.

Application Route: Dermal
Method: Repeated dose toxicity
Remarks: The study is not necessary from a scientific perspective.

Aspiration toxicity

Product:

no data available

Components:

Benzothiazole-2-thiol:

No aspiration toxicity classification

Sodium hydroxide:

Corrosive to the respiratory tract.

Experience with human exposure

Product:

General Information : The possible symptoms known are those derived from the labelling (see section 2).

Components:

Sodium hydroxide:

Components:

Benzothiazole-2-thiol:

Genotoxicity in vitro : Test Type: Ames test
Test system: Salmonella typhimurium
Concentration: 3 - 600 µg/plate
Metabolic activation: with and without metabolic activation
Method: Ames test
Result: negative
GLP: yes

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster lung cells
Concentration: 0,2 - 0,6 µg/ml
Metabolic activation: with and without metabolic activation
Method: Other
Result: negative
GLP: No information available.

Test Type: In vitro gene mutation study in mammalian cells
Test system: mouse lymphoma cells
Concentration: 10 - 100 µg/ml
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
GLP: yes

Genotoxicity in vivo : Test Type: Micronucleus test
Species: Mouse (male and female)
Strain: CD1
Cell type: Bone marrow
Application Route: Intraperitoneal injection
Exposure time: 1-2 treatments, <=72 h
Dose: 300 mg/kg
Method: Other
Result: negative
GLP: yes

Germ cell mutagenicity - Assessment : It is concluded that the product is not mutagenic based on evaluation of several mutagenicity tests.

Sodium hydroxide:

Genotoxicity in vitro : Remarks: In vitro tests did not show mutagenic effects

Genotoxicity in vivo : Remarks: Not classified due to data which are conclusive although insufficient for classification.

Germ cell mutagenicity - Assessment : It is concluded that the product is not mutagenic based on evaluation of several mutagenicity tests.

Carcinogenicity

Product:

Carcinogenicity - Assessment : No information available.

Components:

Benzothiazole-2-thiol:

Carcinogenicity - Assessment : Animal testing did not show any carcinogenic effects.

Sodium hydroxide:

Carcinogenicity - Assessment : Not applicable

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Product:

Reproductive toxicity - Assessment : No information available.
No information available.

Components:

Benzothiazole-2-thiol:

Effects on fertility : Test Type: Two-generation study
Species: Rat, male and female
Strain: Sprague-Dawley
Application Route: oral (feed)
Dose: 2500-8750-15000 ppm
General Toxicity - Parent: NOAEL: 745 - 1,760 mg/kg body weight
General Toxicity F1: NOAEL: 779 - 2,633 mg/kg body weight
General Toxicity F2: NOAEL: ca. 779 - 2,633 mg/kg body weight
Method: OECD Test Guideline 416
GLP: yes

Effects on foetal development : Species: Rabbit
Strain: New Zealand white
Application Route: oral (gavage)
Dose: 50 - 150 - 300 mg/kg
General Toxicity Maternal: NOAEL: 300 mg/kg body weight
Teratogenicity: NOAEL: 300 mg/kg body weight

Method: OECD Test Guideline 414
GLP: yes

Reproductive toxicity - Assessment : No reproductive toxicity to be expected.
No teratogenic effects to be expected.

Sodium hydroxide:

Reproductive toxicity - Assessment : Not applicable

STOT - single exposure

Product:

Remarks: no data available

Components:

Benzothiazole-2-thiol:

Assessment: The substance or mixture is not classified as specific target organ toxicant, single exposure.

Sodium hydroxide:

Assessment: The substance or mixture is not classified as specific target organ toxicant, single exposure.

STOT - repeated exposure

Product:

Remarks: no data available

Components:

Benzothiazole-2-thiol:

Assessment: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Sodium hydroxide:

Assessment: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Repeated dose toxicity

Product:

Remarks: no data available

Components:

Benzothiazole-2-thiol:

Species: Rat, male and female

SAFETY DATA SHEET

CLARIANT

EF NA 078/20

Substance key: 000000854868	Revision Date: 09/17/2020
Version : 1 - 0 / USA	Date of printing :09/17/2020

SECTION 1. IDENTIFICATION

Identification of the company:	Clariant Corporation 4000 Monroe Road Charlotte, NC, 28205 Telephone No.: +1 704 331 7000 **Information of the substance/preparation:** BU Oil & Mining Services Product Stewardship +1-704-331-7710 **Emergency tel. number:** +1 800-424-9300 CHEMTREC

Trade name: **EF NA 078/20**

Primary product use: Flotation agents

Chemical family: flotation agent

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	:	Category 1
Skin corrosion	:	Category 1C
Serious eye damage	:	Category 1
Skin sensitisation	:	Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H290 May be corrosive to metals.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.

Precautionary statements :

Prevention:

P234 Keep only in original container.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing must not be allowed out of the workplace.

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 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.
P390 Absorb spillage to prevent material damage.

Storage:

P405 Store locked up.
P406 Store in corrosive resistant container with a resistant inner liner.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
Mercaptobenzothiazole-sodium (MBT-Na)	2492-26-4	30 - 50
Dithiophosphate	Not Assigned	10 - 20

Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

General advice : Remove/ Take off immediately all contaminated clothing.
Get medical advice/ attention if you feel unwell.

If inhaled : Move the victim to fresh air.
Give oxygen or artificial respiration if needed.
Get immediate medical advice/ attention.
Never give anything by mouth to an unconscious person.

(United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Observe all necessary precautions for handling corrosive liquids.

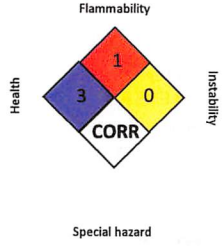
Revision Date : 09/17/2020

US / EN

SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act

In case of skin contact	:	Wash off immediately with plenty of water for at least 15 minutes. Get medical attention immediately if irritation develops and persists. Wash contaminated clothing before reuse.
In case of eye contact	:	Do not wear contact lenses. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get immediate medical advice/ attention.
If swallowed	:	Rinse mouth. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Get medical advice/ attention. Call your local Poison Control Center (In the U.S. call 1-800-222-1222).
Most important symptoms and effects, both acute and delayed	:	The possible symptoms known are those derived from the labelling (see section 2). No additional symptoms are known.
Notes to physician	:	Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Water spray Dry chemical Carbon dioxide (CO2) Alcohol-resistant foam
Unsuitable extinguishing media	:	High volume water jet
Specific hazards during firefighting	:	In case of fires, hazardous combustion gases are formed: Carbon monoxide (CO) Carbon dioxide (CO2)
Further information	:	In the event of fire and/or explosion do not breathe fumes. Emits toxic and corrosive fumes under fire conditions. Do not allow run-off from fire fighting to enter drains or water courses. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for firefighters	:	Wear an approved positive pressure self-contained breathing apparatus in addition to standard fire fighting gear.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Refer to protective measures listed in sections 7 and 8. Avoid contact with skin, eyes and clothing. Wash thoroughly after handling.
Environmental precautions	:	The product should not be allowed to enter drains, water courses or the soil.
Methods and materials for containment and cleaning up	:	Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Clean contaminated surface thoroughly. Incineration in suitable incineration plant, observing local authority regulations

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Keep away sources of ignition. Take precautionary measures against build-up of electrostatic charges, e.g earthing during loading and off-loading operations.
Advice on safe handling	:	Handle in accordance with good industrial hygiene and safety practice. Use only with adequate ventilation/personal protection. For personal protection see section 8. Avoid contact with skin, eyes and clothing. Use only with adequate ventilation. Wash thoroughly after handling.
Further information on storage conditions	:	Store in a cool, dry, well-ventilated area. Keep container sealed when not in use.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Engineering measures	:	Use only in area provided with appropriate exhaust ventilation. Use engineering controls such as local or general exhaust to maintain airborne concentrations below exposure limits.

Personal protective equipment

Respiratory protection	:	In case of inadequate ventilation wear respiratory protection.
Hand protection Remarks	:	Chemical resistant gloves (butyl rubber, nitrile rubber, polyvinyl alcohol). However, please note that PVA degrades

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

A characteristic waste RQ of 100 lbs applies to this product in a waste form: D002

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards	:	Corrosive to metals Respiratory or skin sensitisation Skin corrosion or irritation Serious eye damage or eye irritation
SARA 313	:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Water Act

This product does not contain any priority pollutants related to the U.S. Clean Water Act

The components of this product are reported in the following inventories:

TSCA	:	This product has not been characterized as to whether or not it is in the TSCA Inventory. It is provided only for research and development under the supervision of an individual technically qualified to understand its potential hazards.

Authorization Act		determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations
Waste Code	:	D002
Waste from residues	:	Dispose of this product in accordance with all applicable local, state and federal regulations.
Contaminated packaging	:	Contaminated packaging material should be treated equivalent to residual chemicals. Clean packaging material should be subjected to waste management schemes (recovery recycling, reuse) according to local legislation.

SECTION 14. TRANSPORT INFORMATION

DOT Regulation:

UN/NA-number:	UN 1760
Proper shipping name:	Corrosive liquids, n.o.s.
Technical Name:	Dithiophosphates
Primary hazard class:	8
Packing group:	II
Emergency Response Guide:	154

IATA

UN/ID number:	UN 1760
Proper shipping name:	Corrosive liquid, n.o.s.
Hazard inducer(s):	Dithiophosphates
Primary risk:	8
Packing group:	II
Remarks:	Shipment permitted

IMDG

UN no.:	UN 1760
Proper shipping name:	Corrosive liquid, n.o.s.
Hazard inducer(s):	Dithiophosphates
Hazard inducer / Marine pollutant:	Sodium-2-Mercaptobenzothiazole
Primary risk:	8
Packing group:	II
Marine pollutant:	Marine Pollutant
EmS:	F-A S-C

in water.

Eye protection	:	Wear safety glasses with side shields, chemical splash goggles, and /or full face shield to prevent contact with eyes.
Skin and body protection	:	Wear protective clothing, including long sleeves and gloves, to prevent skin contact.
Protective measures	:	Observe the usual precautions for handling chemicals.
Hygiene measures	:	Wash hands before breaks and at the end of workday. Take off immediately all contaminated clothing and wash it before reuse.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	brown
Odour	:	characteristic
Odour Threshold	:	no data available
pH	:	no data available
Melting point	:	no data available
Boiling point	:	no data available
Flash point	:	> 200.01 °F / > 93.34 °C
Evaporation rate	:	no data available
Self-ignition	:	no data available
Upper explosion limit / upper flammability limit	:	no data available
Lower explosion limit / Lower flammability limit	:	no data available
Vapour pressure	:	no data available
Relative vapour density	:	no data available
Density	:	1.18 - 1.22 g/cm3 (68 °F / 20 °C)

Solubility(ies)
Solubility in other solvents : soluble

Decomposition temperature : no data available

Viscosity
Viscosity, dynamic : no data available

Viscosity, kinematic : no data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Stable under recommended storage conditions.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : Stable under recommended storage conditions.

Conditions to avoid : Keep away from heat and sources of ignition.
Take precautionary measures against static discharges.

Incompatible materials : Incompatible with oxidizing agents.

Hazardous decomposition products : Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).

SECTION 11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

Product:
Acute oral toxicity : Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method

Components:

Mercaptobenzothiazole-sodium (MBT-Na):
Acute oral toxicity : LD50 (Rat, male): 2,100 mg/kg
Method: Other
GLP: no

Acute inhalation toxicity : Remarks: no data available

Acute dermal toxicity : LD50 (Rabbit, male and female): > 7,940 mg/kg
Method: Other

Concentration: 0.1 mg/l
Method: OECD Test Guideline 305C

Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 8
Exposure time: 42 d
Concentration: 0.01 mg/l
Method: OECD Test Guideline 305C

Partition coefficient: n-octanol/water : log Pow: 2.42 (68 °F / 20 °C)
pH: 7
Method: OPPTS 830.7550
GLP: No information available.

Dithiophosphate:
Partition coefficient: n-octanol/water : log Pow: 1.67 (72 °F / 22 °C)
pH: 1
Method: OECD Test Guideline 107
GLP: no

Mobility in soil

Components:

Mercaptobenzothiazole-sodium (MBT-Na):
Distribution among environmental compartments : Koc: 326 - 3560
Method: Other
Remarks: By analogy with a product of similar composition

Other adverse effects

Product:
Additional ecological information : No data is available on the product itself.

Components:

Mercaptobenzothiazole-sodium (MBT-Na):
Results of PBT and vPvB assessment : The substance is not identified as a PBT or as a vPvB substance.

Dithiophosphate:
Results of PBT and vPvB assessment : The substance is not identified as a PBT or as a vPvB substance.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods
RCRA - Resource Conservation and Recovery : This material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : Remarks: no data available

Toxicity to microorganisms : (activated sludge): End point: Bacteria toxicity (respiration inhibition)
Exposure time: 28 d
Test Type: static test
Analytical monitoring: no
Method: OECD Test Guideline 301D
GLP: yes

Persistence and degradability

Components:

Mercaptobenzothiazole-sodium (MBT-Na):

Biodegradability : aerobic
Inoculum: activated sludge
Concentration: 100 mg/l
Biochemical Oxygen Demand (BOD)
Result: Not readily biodegradable.
Biodegradation: 2.5 %
Exposure time: 14 d
Method: OECD Test Guideline 301C

Stability in water : Hydrolysis: (15 %)
Method: OECD Test Guideline 111

Dithiophosphate:

Biodegradability : aerobic
Inoculum: activated sludge
Concentration: 5 mg/l
Biochemical Oxygen Demand (BOD)
Result: Not readily biodegradable.
Biodegradation: 0.4 %
Exposure time: 28 d
Method: OECD Test Guideline 301D
GLP: yes

Stability in water : Test Type: abiotic
Degradation half life (DT50): > 365 d (25 °C) pH: 7
Method: OECD Test Guideline 111
GLP: yes

Bioaccumulative potential

Components:

Mercaptobenzothiazole-sodium (MBT-Na):

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 0.8
Exposure time: 42 d

Dithiophosphate:

Acute oral toxicity : Remarks: no data available

Acute inhalation toxicity : Remarks: no data available

Acute dermal toxicity : Remarks: no data available

Skin corrosion/irritation

Components:

Mercaptobenzothiazole-sodium (MBT-Na):

Species: Rabbit
Exposure time: 4 h
Method: Other
Result: Corrosive after 1 to 4 hours of exposure
GLP: yes

Dithiophosphate:

Result: Corrosive after 1 to 4 hours of exposure

Serious eye damage/eye irritation

Components:

Mercaptobenzothiazole-sodium (MBT-Na):

Species: Rabbit
Result: Risk of serious damage to eyes.
Method: Other
GLP: no

Dithiophosphate:

Assessment: Risk of serious damage to eyes.

Respiratory or skin sensitisation

Components:

Mercaptobenzothiazole-sodium (MBT-Na):

Test Type: Maximisation Test
Species: Guinea pig
Method: OECD Test Guideline 406
Result: May cause sensitisation by skin contact.
GLP: yes
Remarks: By analogy with a product of similar composition

Dithiophosphate:

Remarks: no data available

Assessment: Causes severe skin burns and eye damage.

Germ cell mutagenicity

Components:

Mercaptobenzothiazole-sodium (MBT-Na):

Genotoxicity in vitro : Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: Other
Result: negative
GLP: no

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: Other
GLP: no
Remarks: By analogy with a product of similar composition

Test Type: In vitro gene mutation study in mammalian cells
Test system: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
GLP: no

Genotoxicity in vivo : Test Type: dominant lethal test
Species: Rat (male and female)
Strain: Sprague-Dawley
Application Route: oral (feed)
Exposure time: 13 wk
Dose: 2500, 8750, or 15000 ppm
Method: Other
Result: negative
GLP: yes

Germ cell mutagenicity - Assessment : In vivo tests did not show mutagenic effects, In vitro tests did not show mutagenic effects

Dithiophosphate:

Genotoxicity in vitro : Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
GLP: yes

Test Type: Chromosome aberration test in vitro
Test system: Human lymphocytes
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Method: OECD Test Guideline 210
GLP: yes

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.08 mg/l
End point: Reproduction rate
Exposure time: 21 d
Analytical monitoring: no data available
Method: OECD Test Guideline 211
GLP: No information available.

Toxicity to microorganisms : (activated sludge): 857 mg/l
End point: Bacteria toxicity (respiration inhibition)
Exposure time: 3 h
Test Type: static test
Analytical monitoring: no
Method: ISO 8192
GLP: yes

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

Dithiophosphate:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 791 mg/l
End point: mortality
Exposure time: 96 h
Test Type: semi-static test
Analytical monitoring: yes
Method: OECD Test Guideline 203
GLP: yes

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1,020 mg/l
End point: Immobilization
Exposure time: 48 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 202
GLP: yes

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): 267 mg/l
End point: Growth rate
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
GLP: yes

Toxicity to fish (Chronic toxicity) : Remarks: no data available

Assessment

Aspiration toxicity

Components:

Mercaptobenzothiazole-sodium (MBT-Na):
No aspiration toxicity classification

Dithiophosphate:
No aspiration toxicity classification

Experience with human exposure

Product:

General Information : The possible symptoms known are those derived from the labelling (see section 2).

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Mercaptobenzothiazole-sodium (MBT-Na):

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 0.73 mg/l
End point: mortality
Exposure time: 96 h
Test Type: flow-through test
Analytical monitoring: yes
Method: OECD Test Guideline 203
GLP: No information available.

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 0.71 mg/l
End point: Immobilization
Exposure time: 48 h
Analytical monitoring: no data available
Method: OECD Test Guideline 202
GLP: yes

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): 0.5 mg/l
End point: Growth rate
Exposure time: 72 h
Analytical monitoring: no data available
Method: OECD Test Guideline 201
GLP: no data available

Toxicity to fish (Chronic toxicity) : NOEC (Oncorhynchus mykiss (rainbow trout)): 0.041 mg/l
Exposure time: 89 d
Test Type: flow-through test
Analytical monitoring: yes

GLP: yes

Test Type: Mammalian cell gene mutation assay
Test system: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
GLP: yes

Germ cell mutagenicity - Assessment : In vitro tests did not show mutagenic effects

Carcinogenicity

Components:

Mercaptobenzothiazole-sodium (MBT-Na):
Species: Rat, (male and female)
Application Route: oral (gavage)
Exposure time: 103 wk
Dose: yes
Frequency of Treatment: 5 days/week
Subsequent observation period: 0, 375 or 750 mg/kg bw for mal
LOAEL: 188 mg/kg body weight
Method: OECD Test Guideline 451

Carcinogenicity - Assessment : Not classifiable as a human carcinogen.

Dithiophosphate:

Carcinogenicity - Assessment : No information available.

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Components:

Mercaptobenzothiazole-sodium (MBT-Na):

Effects on fertility : Test Type: Two-generation study
Species: Rat, male and female
Strain: Sprague-Dawley
Application Route: oral (feed)

Dose: 0, 2500, 8750, or 15000 ppm
Duration of Single Treatment: > 70 d
General Toxicity - Parent: NOAEL: 745 mg/kg body weight
General Toxicity F1: NOAEL: 15,000 ppm
General Toxicity F2: NOAEL: 15,000 ppm
Method: OECD Test Guideline 416
GLP: yes

Effects on foetal development : Test Type: Pre-natal
Species: Rabbit, female
Strain: NZW
Application Route: oral (gavage)
Duration of Single Treatment: 12 d
General Toxicity Maternal: NOAEL: 300 mg/kg body weight
Teratogenicity: NOAEL: 300 mg/kg body weight
Method: OECD Test Guideline 414
GLP: yes

Reproductive toxicity - Assessment : No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.

Dithiophosphate:

Effects on fertility : Test Type: reproductive and developmental toxicity study
Species: Rat, male and female
Strain: CD1
Application Route: oral (gavage)
Dose: 0, 60, 200, 600 mg/kg bodywei
Duration of Single Treatment: 28 - 60 d
General Toxicity - Parent: NOAEL: 200 mg/kg body weight
General Toxicity F1: NOAEL: 200 mg/kg body weight
Method: OECD Test Guideline 422
Result: Some evidence of adverse effects on development, based on animal experiments.
GLP: yes

Effects on foetal development : Test Type: Pre-natal
Species: Rat, female
Strain: wistar
Application Route: oral (feed)
Dose: 0, 60, 200, 800 mg/kg bodywei
Duration of Single Treatment: 14 d
General Toxicity Maternal: NOAEL: 800 mg/kg body weight
Teratogenicity: NOAEL: 800 mg/kg body weight
Developmental Toxicity: NOAEL: 800 mg/kg body weight
Embryo-foetal toxicity: NOAEL: 800 mg/kg body weight
Method: OECD Test Guideline 414
GLP: yes

Reproductive toxicity - Assessment : No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.

STOT - single exposure

Components:

Mercaptobenzothiazole-sodium (MBT-Na):

Assessment: The substance or mixture is not classified as specific target organ toxicant, single exposure.

Dithiophosphate:

Assessment: The substance or mixture is not classified as specific target organ toxicant, single exposure.

STOT - repeated exposure

Components:

Mercaptobenzothiazole-sodium (MBT-Na):

Assessment: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Dithiophosphate:

Assessment: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Repeated dose toxicity

Components:

Mercaptobenzothiazole-sodium (MBT-Na):

Species: Rat, male and female
NOAEL: 50 mg/kg bw/day
Application Route: oral (feed)
Exposure time: > 70 d
Number of exposures: daily
Dose: 0, 2500, 8750, or 15000 ppm
Group: yes
Method: Other
GLP: yes
Remarks: By analogy with a product of similar composition

Dithiophosphate:

Species: Rat, male and female
NOAEL: 200 mg/kg bw/day
Application Route: oral (gavage)
Exposure time: 28 - 60 d
Number of exposures: daily
Dose: 0, 60, 200, 600 mg/kg bodyweig
Group: yes
Method: OECD Test Guideline 422
GLP: yes

Repeated dose toxicity - : Causes severe skin burns and eye damage.

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	**KEMTEC 2044 COLLECTOR**
SYNONYMS:	None
PRODUCT DESCRIPTION:	Sodium dialkyl dithiophosphate
INTENDED/RECOMMENDED USE:	Mining Chemical
MANUFACTURER:	Kemtec Mineral Processing • 131/15 Hall St • Port Melbourne, VIC 3207 • Australia
PRODUCT INFORMATION:	Tel: +61 3 96463833 • Fax: +61 3 96463933
EMERGENCY PHONE:	INFOSAFE 1800 638 556 (24 hrs)
ISSUE DATE:	April 30, 2012

COMPONENT	CAS No.	% (w/w)	OSHA (PEL)	ACGIH (TLV)	Carcinogen
Sodium Diisobutyl dithiophosphate	53378-51-1	35.0-50.0	Not established	-	-
Sodium hydroxide	1310-73-2	0-1	2mg/m^3 (TWA)	2 mg/m^3 (ceiling)	-
Inorganics sulphides		0-3.8	Not established	Not established	-

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE AND ODOR

Color: Yellow – brown
Appearance: Liquid
Odor: Slight sulfur odor, alcohol

STATEMENT OF HAZARD

DANGER! CAUSES EYE BURNS AND SKIN IRRITION

POTENTIL HEALTH EFFECTS

EFFECTS/ROUTES OF EXPOSURE

Acute oral (rat) and acute dermal (rabbit) LD50 values for a similar product are 3.54 g/kg and 7.07 g/kg, respectively. Direct contact with this material may cause severe eye and skin irritation. Contact with acid may cause liberation of hydrogen sulfide. Hydrogen sulfide has a strong rotten-egg odor, however, some people are unable to smell the gas and exposure will deaden the sense of smell. Therefore, odor is an unreliable indicator of exposure. Overexposure to hydrogen sulfide gas may cause severe eye or respiratory tract irritation, rapid development of coma and respiratory failure. Low levels of hydrogen sulfide may cause headache, dizziness, staggering gait, neurological damage and gastritis. Refer to Section 11 for toxicology information on regulated components of this product.

4. FIRST AID MEASURES

INGESTION:	If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.
SKIN CONTACT:	Take off immediately all contaminated clothing. Wear impermeable gloves. Wash immediately with plenty of water and soap. Pay particular attention to skin crevices, nail folds, etc. Do not reuse contaminated clothing without laundering. Do not reuse contaminated leatherware.
EYES CONTACT:	In case of eye contact, immediately irrigate with plenty of water for 15 minutes. Obtain medical attention without delay.
INHALATON:	Remove to fresh air. If breathing is difficult, give oxygen. Obtain medical advice if there are persistent symptoms.

5. FIREFIGHTING MEASURES

EXTINGUISHING MEDIA AND FIRE FIGHTING INSTRUCTIONS

Extinguishing Media:	Use water spray or fog, carbon dioxide or dry chemical to extinguish fires.
Protective Equipment:	Firefighters, and others exposed, wear self-contained breathing apparatus. Wear full firefighting protective clothing. See MSDS Section 8 (Exposure Controls/Personal Protection).
Special Hazards:	Sulfur dioxide or hydrogen sulfide may be formed under fire conditions. Do not flush to sewer which may contain acid. This could result in generation of toxic and explosive hydrogen sulfide gas.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:	Where exposure level is not known, wear approved, positive pressure, self-contained respirator. Where exposure level is known, wear approved respirator suitable for level of exposure. In addition to the protective clothing/equipment in Section 8, wear impervious boots and rain suit.
METHODS FOR CLEAN UP:	Cover spills with some inert absorbent material. Sweep up and place in a waste disposal container. Flush area with water.
ENVIRONMENTAL PRECAUTIONS:	Dispose of in accordance with EPA rules and regulations.

7. HANDLING AND STORAGE

HANDLING

Precautionary Measures :	Do not get in eyes, on skin, on clothing. Wash thoroughly after handling.
Special Handling Statements :	This product should not be mixed with acids since evolution of toxic and explosive hydrogen sulfide gas could result. This precaution does not, of course, apply to addition of this reagent to flotation pulps in amounts customarily used in flotation.

STORAGE

None

Storage Temperature: Room temperature
Reason: Product integrity

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

ENGINEERING MEASURES	Utilize a closed system process when available. Where this material is not used in a closed system, good enclosure and local exhaust ventilation should be provided to control exposure.
RESPIRATORY PROTECTION:	Where exposures are below the established exposure limit, no respiratory protection is required. Where exposures exceed the established exposure limit, use respiratory protection recommended for the material and level of exposure.
EYE PROTECTION:	Wear eye/face protection such as chemical splash proof goggles or face shield. Eyewash equipment and safety shower should be provided in areas of potential exposure.
SKIN PROTECTION:	Avoid skin contact. Wear impermeable gloves and suitable protective clothing.
ADDITIONAL ADVICE:	Food, beverage and tobacco products should not be carried, stored or consumed where this material is used. Before eating, drinking, or smoking, wash face and hands with soap and water.

9. PHYSICAL AND CHEMICAL PROPERTIES

COLOR, APPEARANCE AND ODOR:	Amber to dark brown, clear liquid; Slight sulfur, alcohol
BOILING POINT:	Similar to water
MELTING POINT:	15.8ºF - 9 ºC
VAPOR PRESSURE:	Similar to water
SPECIFIC GRAVITY:	1.1-1.12 @ 25ºc
VAPOR DENSITY:	Similar to water
% VOLATILE (BY WT.):	>50 (water)
pH:	11.0 (minimum)
SATURATION IN AIR (% by Vol):	Similar to water
EVAPORATION RATE:	Similar to water
SOLUBILITY IN WATER:	Complete
VOLATILE ORGANIC CONTENT (EU):	Not available
FLASH POINT:	>200ºF, 93ºC, Pensky-Martens Closed Cup
FLAMMABLE LIMITS (% BY VOL.):	Not available
AUTOIGNITION TEMPERATURE:	Not available
DECOMPOSITION TEMPERATURE:	Not available
PARTIAL COEFFICIENT (n-octanol/water):	Not available
ODOR TRESHOLD:	See Section 2 for exposure limits

10. STABILITY AND REACTIVITY

STABILITY:	Stable
CONDITIONS TO AVOID:	None known
POLYMERIZATION:	Will not occur
CONDITIONS TO AVOID:	None known
MATERIALS TO AVOID:	This product contains a neutralized dithio acid. Avoid contact with strong oxidizing agents and mineral acids.
HAZARDOUS DECOMPOSITION PRODUCTS:	Carbon dioxide, carbon monoxide; oxides of sulfur (includes sulfur di and tri oxides), oxides of phosphorus, hydrogen sulfide.

11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under SECTION 3: HAZARDS IDENTIFICATION.
Toxicological information on the regulated components of this product is as follows:

Inorganic sulfides are highly toxic with acute oral (RAT) and dermal (rabbit) LD50 values of approximately 100 mg/kg and 200 mg/kg, respectively. Direct contact causes irritation, pain and possible second degree burns after a few minutes of skin contact, and can cause severe eye irritation with edema and possible corneal destruction. Inhalation produces coughing, choking, headache, dizziness, weakness and difficult breathing. Short or infrequent exposures to hydrogen sulfide mist may produce irritation of respiratory passages. Lung congestion, cyanosis, bloody sputum and chest tightness may occur 6-8 hours following exposure. Ingestion will irritate/burn mouth, throat and gastrointestinal tract. Contact with stomach acid will cause hydrogen sulfide vapors to be released. Solutions can also evolve hydrogen sulfide gas under normal storage conditions. Hydrogen sulfide is readily absorbed through the skin, lungs and digestive tract lining. In the body, when hydrogen sulfide metabolism is exceeded, acute systemic poisoning results causing unconsciousness, respiratory paralysis and death.

Sodium hydroxide is corrosive to eyes, skin and the soft tissues of the digestive and respiratory tracts. Even dilute solutions of sodium hydroxide can produce irreversible damage to eyes and skin. A one percent solution/24hrs caused severe eye irritation in monkeys. Acute overexposure to sodium hydroxide mists or dusts causes severe respiratory irritation. The acute oral (rat) and dermal (rabbit) LD50 values are 104-340 mg/kg and 1250 mg/kg, respectively. The human oral LDL0 is 1.57 mg/kg.

Sodium diisobutyldithiophosphate has estimated acute oral (rat) and dermal (rabbit) LD50 values of greater than 5000 mg/kg and 2000 mg/kg, respectively. Direct contact with sodium diisobutyldithiophosphate can cause eye burns and skin corrosion.

12. ECOLOGICAL INFORMATION

The ecological properties for this material is based on an evaluation of its components.
This material is not readily biodegradable.
This material is not classified as dangerous for the environment.

ALGAE TEST RESULTS

Test	Duration	Procedure	Species	Results	

FISH TEST RESULTS

Test	Duration	Procedure	Species	Results	
Acute toxicity, freshwater (OECD 203)	96 hr.		Rainbow Trout (Oncorhynus mykiss)	>125 mg/l	LC50

INVERTEBRATE TEST RESULTS

Test	Duration	Procedure	Species	Results	
Acute Immobilization (OECD 202)	48 hr.		Chinook Salmon (oncorhyncus tshawytscha)	>100mg/l	

ACCUMULATION TEST RESULTS

Test	Duration	Procedure	Species	Results	

Degradation

Test	Duration	Procedure	Results
Closed Bottle (OECD 301D)	28 days	Ready biogradability	<70%

Comment: Material does not significantly bio-accumulate

13. DISPOSAL CONSIDERATIONS

RECOMMENDATIONS FOR THE PRODUCT: In accordance with regulations for special waste, product must be taken, after pretreatment, to an authorized special waste incineration plant.

RECOMMENDATIONS FOR PACKAGING: Packaging that cannot be cleaned should be disposed of like the product.

RECOMMENDATIONS CLEANSING AGENT: Water

14. TRANSPORTATION INFORMATION

This section provides basic shipping classification information.
Refer to appropriate transportation regulations for specific requirements.

U.S. DOT				
PROPER SHIPPING NAME:	CAUSTIC ALKALI LIQUID, N.O.S.			
HAZARD CLASS	8			
PACKING GROUP:	II			
UN/ID NUMBER:	UN1719			
TRANSPORT LABEL REQUIRED:	CORROSIVE			
TECHNICAL NAME (N.O.S.):	Contains dithiophosphate salt			
HAZARDOUS SUBSTANCE:	Not applicable			
COMMENTS:				
TRANSPORT CANADA				
PROPER SHIPPING NAME:	CAUSTIC ALKALI LIQUID, N.O.S.			
HAZARD CLASS	8			
PACKING GROUP:	II			
UN/ID NUMBER:	UN1719			
TRANSPORT LABEL REQUIRED:	CORROSIVE			
TECHNICAL NAME (N.O.S.):	Contains dithiophosphate salt			
ICAO/IATA				
PROPER SHIPPING NAME:	CAUSTIC ALKALI LIQUID, N.O.S.			
HAZARD CLASS:	8			
PACKING GROUP:	II			
UN NUMBER:	UN1719			
TRANSPORT LABEL REQUIRED:	CORROSIVE			
PACKING INSTRUCTIONS/ MAXIMUM NET QUANTITY:	PASSENGER AIRCRAFT	809	1L	
	CARGO AIRCRAFT	813	30L	
TECHNICAL NAME (N.O.S.):	Contains dithiophosphate salt			
IMO				
PROPER SHIPPING NAME:	CAUSTIC ALKALI LIQUID, N.O.S.			
HAZARD CLASS:	8			
UN NUMBER:	II			
PACKING GROUP:	UN1719			
TRANSPORT LABEL REQUIRED:	CORROSIVE			
TECHNICAL NAME (N.O.S.):	Contains dithiophosphate salt			

15. REGULATORY INFORMATION

INVENTORY INFORMATION

United States (USA)	This product is manufactured in compliance with all provisions of the Toxic Substances Control Act, 15 U.S.C. 2601 et. Seq.
Canada	Components of this product have been reported to Environment Canada in accordance with Sections 66 and/or 81 of the Canadian Environmental Protection Act (1999), and are included on the Domestic Substance List.
European Union (EU)	All components of this product are included in the European Inventory of Existing Chemical Substances (EIECS) in compliance with Council Directive 67/548/EEC and its amendments.
Australia	All components of this product are included in the Australian Inventory of Chemical Substances (AICS).
China	All components of this product are included on the Chinese inventory or are not required to be listed on the Chinese inventory.
Japan	All components of this product are included on the Japanese (ENCS) inventory or are not required to be listed on the Japanese inventory.
Korea	All components of this product are included on the Korean (ECL) inventory or are not required to be listed on the Korean inventory.
Philippines	All components of this product are NOT included on the Philippine (PICCS) inventory.

OTHER ENVIRONMENTAL INFORMATION

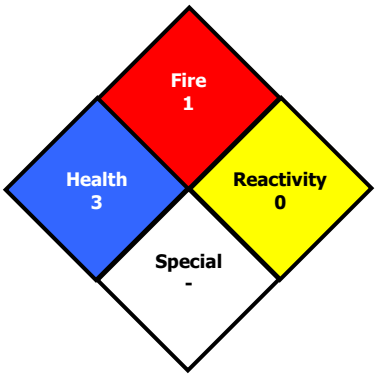
The following components of this product may be subject to reporting requirements pursuant to Section 313 of CERCLA (40 CFR 372), Section 12(b) of TSCA, or may be subject to release reporting requirements (40 CFR 307, 40 CFR 311, etc.) See Section 13 for information on waste classification and waste disposal of this product.

Component	CAS NO.	% (w/w)	TPQ (lbs)	RQ (lbs)	S313	TSCA 12B
This product does not contain any components regulated under these sections of the EPA.						

PRODUCT CLASSIFICATION UNDER SECTION 311 OF SARA

ACUTE (Y)	CHRONIC (N)	FIRE (Y)	REACTIVE (N)	PRESSURE (N)

16. OTHER INFORMATION



NFPA HAZARD RATING
(National Fire Protection Association)

HEALTH - 3 -	Materials that, under emergency conditions can cause serious or permanent injury.
FIRE - 1 -	Materials that must be preheated before ignition can occur.
REACTIVITY - 0 -	Materials that in themselves are normally stable, even under fire exposure conditions.

REASON FOR REVISION: Emergency contact update

Prepared By: Kenneth Lee **Revised By:** Nicole Watt

IMPORTANT: The above information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warrant, expressed or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular uses.

Orfom® CO210 Collector

Version 1.5 Revision Date 2019-12-18

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product information

Product Name : Orfom® CO210 Collector
Material : 1122016, 1121512, 1118478, 1117769, 1117768, 1117418, 1117417

Company : Chevron Phillips Chemical Company LP
10001 Six Pines Drive
The Woodlands, TX 77380

Emergency telephone:

Health:
866.442.9628 (North America)
1.832.813.4984 (International)
Transport:
CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Mexico CHEMTREC 01-800-681-9531 (24 hours)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600
Argentina: +(54)-1159839431

Responsible Department : Product Safety and Toxicology Group
E-mail address : SDS@CPChem.com
Website : www.CPChem.com

SECTION 2: Hazards identification

Classification of the substance or mixture
This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

Classification

: Skin irritation, Category 2
Eye irritation, Category 2A
Skin sensitization, Sub-category 1B

Labeling

Symbol(s) :

Signal Word : Warning

Hazard Statements : H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.

Precautionary Statements : **Prevention:**
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves/ eye protection/ face protection.
Response:
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
Storage:
P403 + P235 Store in a well-ventilated place. Keep cool.
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Potential Health Effects

Primary Routes of Entry : Skin Absorption

Target Organs : Skin
Eyes

Carcinogenicity:

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

SECTION 3: Composition/information on ingredients

Synonyms : TDM

Molecular formula : C12H26S

Component	CAS-No.	Weight %
tert-Dodecanethiol	25103-58-6	90 - 100

SECTION 4: First aid measures

General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.

If inhaled : If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.

In case of skin contact : If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact : Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear. If symptoms persist, call a physician. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point : 98-110°C (208-230°F)

Autoignition temperature : 198-230°C (388-446°F)

Unsuitable extinguishing media : High volume water jet.

Specific hazards during fire fighting : Do not allow run-off from fire fighting to enter drains or water courses.

Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.

Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Fire and explosion protection : Normal measures for preventive fire protection.

Hazardous decomposition products : Carbon oxides. Sulfur oxides.

SECTION 6: Accidental release measures

Personal precautions	:	Use personal protective equipment. Ensure adequate ventilation.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods for cleaning up	:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

SECTION 7: Handling and storage

Handling

Advice on safe handling	:	Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.

Storage

Requirements for storage areas and containers	:	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8: Exposure controls/personal protection

Ingredients with workplace control parameters

Chevron Phillips Chemical Company LP

Components	Basis	Value	Control parameters	Note
tert-Dodecanethiol	Manufacturer	TWA	0.1 ppm,	

US

Components	Basis	Value	Control parameters	Note

Contains no substances with occupational exposure limit values.

Engineering measures

Adequate ventilation to control airborned concentrations below the exposure guidelines/limits.

Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

Respiratory protection	:	Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as:. Air-Purifying Respirator for Dusts and Mists / P100. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.
Hand protection	:	The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Eye protection	:	Eye wash bottle with pure water. Tightly fitting safety goggles. Wear face-shield and protective suit for abnormal processing problems.
Skin and body protection	:	Choose body protection according to the amount and concentration of the dangerous substance at the work place. Wear as appropriate:. Protective suit. Safety shoes.
Hygiene measures	:	When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.
Protective measures	:	Wear suitable protective equipment. When using do not eat, drink or smoke. Avoid contact with skin.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance

Physical state	:	Liquid
Color	:	Colorless
Odor	:	mild hydrocarbon

Safety data

Flash point	:	98-110°C (208-230°F)
Lower explosion limit	:	No data available

Upper explosion limit	:	No data available
Oxidizing properties	:	no
Autoignition temperature	:	198-230°C (388-446°F)
Thermal decomposition	:	300 °F
Molecular formula	:	C12H26S
Molecular weight	:	202.44 g/mol
pH	:	Not applicable
Pour point	:	No data available
Melting point/range		-16°C (3°F)
Boiling point/boiling range	:	233°C (451°F)
Vapor pressure	:	4.00 Pa at 24°C (75°F)
Relative density	:	0.86 at 16 °C (61 °F)
Water solubility	:	0.00393 mg/l Method: OECD Test Guideline 105
Partition coefficient: n-octanol/water	:	Pow: 7.43 at 20°C (68°F)
Viscosity, dynamic	:	2.6 cP at 20°C (68°F)
Viscosity, kinematic	:	No data available
Relative vapor density	:	3 (Air = 1.0)
Evaporation rate	:	< 1

SECTION 10: Stability and reactivity

Chemical stability : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

Hazardous reactions : Further information: No decomposition if stored and applied as directed.

Conditions to avoid : Heat, sparks, fire, and oxidizing agents.

Materials to avoid : May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Thermal decomposition : 300 °F

Hazardous decomposition products : Carbon oxides
Sulfur oxides

Other data : No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

Acute oral toxicity

tert-Dodecanethiol : LD50: > 2,000 mg/kg
Species: Rat
Sex: female
Method: OECD Test Guideline 423

Acute inhalation toxicity

tert-Dodecanethiol : LC50: > 1.97 mg/l
Exposure time: 4 h
Species: Rat
Sex: male and female
Method: OECD Test Guideline 403
Information given is based on data obtained from similar substances.

Acute dermal toxicity

tert-Dodecanethiol : LD50: > 2,000 mg/kg
Species: Rat
Sex: male
Method: OECD Test Guideline 402
Information given is based on data obtained from similar substances.

Skin irritation

tert-Dodecanethiol : Skin irritation

Eye irritation

tert-Dodecanethiol : Eye irritation

Sensitization

tert-Dodecanethiol : The product is a skin sensitizer, sub-category 1B.

Repeated dose toxicity

tert-Dodecanethiol : Species: Rat, male
Sex: male
Application Route: Inhalation
Dose: 0, 26, 98 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
Lowest observable effect level: 26 ppm
Method: OECD Test Guideline 412
Target Organs: Kidney, Liver

Species: Rat, female
Sex: female
Application Route: Inhalation
Dose: 0, 26, 98 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
NOEL: 26 ppm
Method: OECD Guideline 412
Target Organs: Liver, Kidney

Species: Dog, male and female
Sex: male and female
Application Route: Inhalation
Dose: 0, 25, 106 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
NOEL: 25 ppm
Lowest observable effect level: 109 ppm
Method: OECD Test Guideline 412
Target Organs: Liver

Species: Mouse, male and female
Sex: male and female
Application Route: Inhalation
Dose: 0, 25, 109 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
Lowest observable effect level: 25 ppm
Method: OECD Test Guideline 412
Target Organs: Liver

Species: Rat, male
Sex: male
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg
Exposure time: 35 d
Number of exposures: once daily
NOEL: 50 mg/kg
Method: OECD Guideline 422
Target Organs: Liver, spleen
Information given is based on data obtained from similar substances.

Species: Rat, female
Sex: female
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg
Exposure time: 53 d
Number of exposures: once daily
NOEL: 50 mg/kg
Method: OECD Guideline 422
Target Organs: Liver, spleen
Information given is based on data obtained from similar substances.

Species: Rat, male
Sex: male
Application Route: Inhalation
Dose: 5, 25, 100 ppm
Exposure time: 90 d

Number of exposures: 6h/d, 5d/wk
NOEL: 25 ppm
Method: OECD Test Guideline 413

Species: Rat, female
Sex: female
Application Route: Inhalation
Dose: 5, 25, 100 ppm
Exposure time: 90 d
Number of exposures: 6h/d, 5d/wk
NOEL: 25 ppm
Method: OECD Test Guideline 413

Genotoxicity in vitro

tert-Dodecanethiol : Test Type: Ames test
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Test Type: Mouse lymphoma assay
Metabolic activation: with and without metabolic activation
Method: OECD Guideline 476
Result: negative

Test Type: Sister Chromatid Exchange Assay
Metabolic activation: with and without metabolic activation
Method: OECD Guideline 479
Result: negative

Test Type: Chromosome aberration test in vitro
Metabolic activation: with and without metabolic activation
Method: OECD Guideline 473
Result: Ambiguous

Genotoxicity in vivo

tert-Dodecanethiol : Test Type: In vivo micronucleus test
Species: Mouse
Route of Application: Oral
Dose: 1250, 2500, 5000 mg/kg/bw
Method: Mutagenicity (micronucleus test)
Result: negative
Remarks: Information given is based on data obtained from similar substances.

Reproductive toxicity

tert-Dodecanethiol : Species: Rat
Sex: male
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg/d
Exposure time: 35 d
Number of exposures: Daily
Method: OECD Guideline 422
NOAEL Parent: >= 250 mg/kg
Information given is based on data obtained from similar substances.

Species: Rat
Sex: female
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg/d
Exposure time: 53 d
Number of exposures: Daily
Method: OECD Guideline 422
NOAEL Parent: 50 mg/kg
NOAEL F1: 50 mg/kg
Information given is based on data obtained from similar substances.
Decrease in Delivery Index

Developmental Toxicity

tert-Dodecanethiol : Species: Rat
Application Route: Inhalation
Dose: 0, 22.7, 88.6 ppm
Number of exposures: 6 hrs/d
Test period: GD 6-19
Method: OECD Guideline 414
NOAEL Teratogenicity: >= 88.6 ppm
No adverse effects expected

Species: Mouse
Application Route: Inhalation
Dose: 0, 22.7, 88.6 ppm
Number of exposures: 6 hrs/d
Test period: GD 6-19
Method: OECD Guideline 414
NOAEL Teratogenicity: >= 88.6 ppm
No adverse effects expected

Orfom® CO210 Collector
Aspiration toxicity : May be harmful if swallowed and enters airways.

CMR effects

tert-Dodecanethiol : Carcinogenicity: Not available
Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Teratogenicity: Animal testing did not show any effects on fetal development.
Reproductive toxicity: No toxicity to reproduction

Orfom® CO210 Collector
Further information : Solvents may degrease the skin.

SECTION 12: Ecological information

Toxicity to fish

tert-Dodecanethiol : LL50: > 100 mg/l
Exposure time: 96 h
Species: Danio rerio (Zebra Fish)

static test Method: OECD Test Guideline 203
No toxicity at the limit of solubility.

Toxicity to daphnia and other aquatic invertebrates

tert-Dodecanethiol : EC50: > 0.056 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
semi-static test Method: OECD Test Guideline 202
No toxicity at the limit of solubility.

Toxicity to bacteria

tert-Dodecanethiol : NOEC: 8.6 mg/l
Exposure time: 3 h
Growth rate
Respiration inhibition
Method: OECD Test Guideline 209

NOEC: > 10 mg/l
Exposure time: 3 h
Growth rate
Respiration inhibition
Method: OECD Test Guideline 209

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

tert-Dodecanethiol : NOEC: 0.0108 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
semi-static test
Method: OECD Test Guideline 211
No toxicity at the limit of solubility.

Biodegradability

tert-Dodecanethiol : Result: Not readily biodegradable.
0 %
Testing period: 28 d
Method: OECD Test Guideline 301D

Bioaccumulation

tert-Dodecanethiol : Species: Danio rerio (zebra fish)
Exposure time: 15 d
Bioconcentration factor (BCF): > 500 - < 1,950
Method: OECD Test Guideline 305
Biomagnification factor <1
The product may be accumulated in organisms.

Results of PBT assessment
tert-Dodecanethiol : Non-classified PBT substance, Non-classified vPvB substance

Additional ecological information : May cause long lasting harmful effects to aquatic life.

Ecotoxicology Assessment

Short-term (acute) aquatic hazard
tert-Dodecanethiol : No toxicity at the limit of solubility.

Long-term (chronic) aquatic hazard
tert-Dodecanethiol : May cause long lasting harmful effects to aquatic life.

Toxicity Data on Soil
tert-Dodecanethiol : Adsorbs on soil.

SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product : The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)

UN3334, AVIATION REGULATED LIQUID, N.O.S., (TERT-DODECANETHIOL), 9, III

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

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

Other information	**:**	**tert- Dodecanethiol, S.T. 3, Cat.Y**

SECTION 15: Regulatory information

National legislation

SARA 311/312 Hazards	:	Skin corrosion or irritation Serious eye damage or eye irritation Respiratory or skin sensitization
CERCLA Reportable Quantity	:	This material does not contain any components with a CERCLA RQ.
SARA 302 Reportable Quantity	:	This material does not contain any components with a SARA 302 RQ.
SARA 302 Threshold Planning Quantity	:	This material does not contain any components with a section 302 EHS TPQ.
SARA 304 Reportable Quantity	:	This material does not contain any components with a section 304 EHS RQ.
SARA 313 Components	:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

Ozone-Depletion Potential : This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

US State Regulations

Pennsylvania Right To Know : tert-Dodecanethiol - 25103-58-6

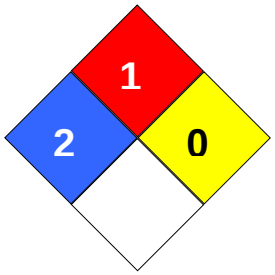
California Prop. 65 Components : This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

Notification status

Europe REACH	:	This product is in full compliance according to REACH regulation 1907/2006/EC.
Switzerland CH INV	:	On the inventory, or in compliance with the inventory
United States of America (USA) TSCA	:	On or in compliance with the active portion of the TSCA inventory
Canada DSL	:	All components of this product are on the Canadian DSL
Australia AICS	:	On the inventory, or in compliance with the inventory
New Zealand NZIoC	:	On the inventory, or in compliance with the inventory
Japan ENCS	:	On the inventory, or in compliance with the inventory
Korea KECI	:	All substances in this product were registered, notified to be registered, or exempted from registration by CPChem through an Only Representative according to K-REACH regulations. Importation of this product is permitted if the Korean Importer of Record was included on CPChem's notifications or if the Importer of Record themselves notified the substances.
Philippines PICCS	:	On the inventory, or in compliance with the inventory
China IECSC	:	On the inventory, or in compliance with the inventory
Taiwan TCSI	:	On the inventory, or in compliance with the inventory

SECTION 16: Other information

NFPA Classification : Health Hazard: 2
Fire Hazard: 1
Reactivity Hazard: 0



Further information

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

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.

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and

			Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

Orfom® MC2 Collector

Version 1.4 Revision Date 2018-02-13

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product information

Product Name	:	Orfom® MC2 Collector
Material	:	1115718, 1115539, 1115287, 1115286, 1115285, 1115283
Use	:	Flotation Collector
Company	:	Chevron Phillips Chemical Company LP 10001 Six Pines Drive The Woodlands, TX 77380

Emergency telephone:

Health:
866.442.9628 (North America)
1.832.813.4984 (International)
Transport:
CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Mexico CHEMTREC 01-800-681-9531 (24 hours)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600
Argentina: +(54)-1159839431

Responsible Department	:	Product Safety and Toxicology Group
E-mail address	:	SDS@CPChem.com
Website	:	www.CPChem.com

SECTION 2: Hazards identification

Classification of the substance or mixture
This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

Classification

: Eye irritation, Category 2B

Labeling

Signal Word	:	Warning
Hazard Statements	:	H320: Causes eye irritation.

Precautionary Statements : **Prevention:**
P264 Wash skin thoroughly after handling.
Response:
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical advice/ attention.

Carcinogenicity:

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

SECTION 3: Composition/information on ingredients

Synonyms : Ethyl-n-Octyl Sulfide
Collector, Sulfur-Based Collector

Molecular formula : C10H22S

Component	CAS-No.	Weight %
Ethyl n-Octyl Sulfide	3698-94-0	92 - 100
Ethyl 2-Octyl Sulfide	53970-40-4	5 - 10

SECTION 4: First aid measures

General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.

If inhaled : If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.

In case of skin contact : If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact : Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point : 93.9 °C (201.0 °F)

		Method: PMCC estimated
Autoignition temperature	:	No data available
Unsuitable extinguishing media	:	High volume water jet.
Specific hazards during fire fighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Special protective equipment for fire-fighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Fire and explosion protection	:	Normal measures for preventive fire protection.
Hazardous decomposition products	:	Carbon oxides. Sulfur oxides.

SECTION 6: Accidental release measures

Personal precautions	:	Use personal protective equipment. Ensure adequate ventilation.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods for cleaning up	:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

SECTION 7: Handling and storage

Handling

Advice on safe handling	:	Do not breathe vapors/dust. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Dispose of rinse water in accordance with local and national regulations.
Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.

Storage

Requirements for storage areas and containers	:	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and

kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8: Exposure controls/personal protection

Engineering measures

Adequate ventilation to control airborned concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

Respiratory protection	:	Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as:. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.
Hand protection	:	The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Eye protection	:	Eye wash bottle with pure water. Tightly fitting safety goggles.
Skin and body protection	:	Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate:. Protective suit. Safety shoes.
Hygiene measures	:	When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance

Form	:	Liquid
Physical state	:	Liquid
Color	:	Colorless
Odor	:	unpleasant

Safety data

Flash point	:	93.9 °C (201.0 °F) Method: PMCC estimated
Lower explosion limit	:	0.7 %(V)
Upper explosion limit	:	5.7 %(V)
Oxidizing properties	:	No
Autoignition temperature	:	No data available
Molecular formula	:	C10H22S
Molecular weight	:	174.38 g/mol
pH	:	Not applicable
Boiling point/boiling range	:	232 °C (450 °F) estimated
Vapor pressure	:	0.24 MMHG at 37.8 °C (100.0 °F)
Relative density	:	0.844 at 15.6 °C (60.1 °F), estimated
Water solubility	:	Insoluble
Partition coefficient: n-octanol/water	:	No data available
Viscosity, kinematic	:	No data available
Relative vapor density	:	No data available
Evaporation rate	:	< 1
Percent volatile	:	< 99 %

SECTION 10: Stability and reactivity

Chemical stability	:	This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

Conditions to avoid	:	No data available.
Materials to avoid	:	Avoid oxidizing agents.
Hazardous decomposition	:	Carbon oxides

products		Sulfur oxides
Other data	:	No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

Orfom® MC2 Collector
Acute dermal toxicity : Acute toxicity estimate: 2,174 mg/kg
Method: Calculation method

Acute toxicity estimate: 2,174 mg/kg
Method: Calculation method

Orfom® MC2 Collector
Skin irritation : May cause skin irritation and/or dermatitis.

Orfom® MC2 Collector
Eye irritation : Vapors may cause irritation to the eyes, respiratory system and the skin.

Sensitization

Ethyl n-Octyl Sulfide : Does not cause skin sensitization.
Information given is based on data obtained from similar substances.

Repeated dose toxicity

Ethyl n-Octyl Sulfide : Species: Rat, Male and female
Sex: Male and female
Application Route: Oral
Dose: 0, 74, 368, 1842 mg/kg/day
Exposure time: 13 wks
NOEL: > 1842 mg/kg/day
Information given is based on data obtained from similar substances.

Species: Rabbit, Male and female
Sex: Male and female
Application Route: Dermal
Dose: 50, 100, 200 mg/kg/day
Exposure time: 21 days
NOEL: > 200 mg/kg/day
Information given is based on data obtained from similar substances.

Developmental Toxicity

Ethyl n-Octyl Sulfide : Species: Rat
Application Route: oral gavage
Dose: 0, 100, 300, 1000 mg/kg.d
Number of exposures: daily
Test period: GD 6 - 15
Method: OECD Guideline 414
NOAEL Teratogenicity: 300 mg/kg/day
NOAEL Maternal: 1000 mg/kg/day

Information given is based on data obtained from similar substances.

Species: Rat
Application Route: oral gavage
Dose: 47, 187. 748 mg/kg/day
Number of exposures: daily
Test period: GD 5 - 15
Method: OECD Guideline 414
NOAEL Teratogenicity: 748 mg/kg/day
NOAEL Maternal: 748 mg/kg/day
Information given is based on data obtained from similar substances.

Orfom® MC2 Collector
Aspiration toxicity : No aspiration toxicity classification.

CMR effects

Ethyl n-Octyl Sulfide : Carcinogenicity: Not available
Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Teratogenicity: Animal testing did not show any effects on fetal development.
Reproductive toxicity: Animal testing did not show any effects on fertility.

Orfom® MC2 Collector
Further information : Solvents may degrease the skin.

SECTION 12: Ecological information

Toxicity to fish

Ethyl n-Octyl Sulfide : LC50: > 1.4 mg/l
Exposure time: 96 h
Species: Pimephales promelas (fathead minnow)
No toxicity at the limit of solubility.

Toxicity to daphnia and other aquatic invertebrates

Ethyl n-Octyl Sulfide : EC50: 0.73 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)

Biodegradability

Ethyl n-Octyl Sulfide : This material is expected to be readily biodegradable.

Ecotoxicology Assessment

Acute aquatic toxicity
Ethyl 2-Octyl Sulfide : Very toxic to aquatic life.

Additional ecological information	:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Very toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product	:	The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (ETHYL N-OCTYL SULFIDE), 9, III, (93.9 °C), MARINE POLLUTANT, (ETHYL N-OCTYL SULFIDE)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (ETHYL N-OCTYL SULFIDE), 9, III

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (ETHYL N-OCTYL SULFIDE), 9, III

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (ETHYL N-OCTYL

SULFIDE), 9, III

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (ETHYL N-OCTYL SULFIDE), 9, III

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

SECTION 15: Regulatory information

National legislation

SARA 311/312 Hazards : Serious eye damage or eye irritation

EPCRA - EMERGENCY PLANNING COMMUNITY RIGHT - TO – KNOW

CERCLA Reportable Quantity	:	This material does not contain any components with a CERCLA RQ.
SARA 302 Reportable Quantity	:	This material does not contain any components with a SARA 302 RQ.
SARA 302 Threshold Planning Quantity	:	No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
SARA 304 Reportable Quantity	:	This material does not contain any components with a section 304 EHS RQ.
SARA 313 Ingredients	:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

Ozone-Depletion Potential	:	This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

US State Regulations

Pennsylvania Right To Know : No components are subject to the Pennsylvania Right to Know Act.

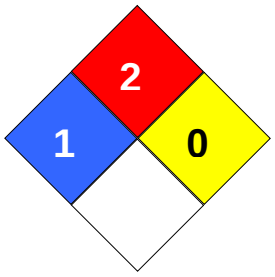
California Prop. 65 Ingredients : This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

Notification status

Europe REACH	:	Not in compliance with the inventory
United States of America (USA) TSCA	:	On the inventory, or in compliance with the inventory
Canada DSL	:	On the inventory, or in compliance with the inventory
Australia AICS	:	On the inventory, or in compliance with the inventory
New Zealand NZIoC	:	Not in compliance with the inventory
Japan ENCS	:	Not in compliance with the inventory
Korea KECI	:	Not in compliance with the inventory
Philippines PICCS	:	On the inventory, or in compliance with the inventory
China IECSC	:	Not in compliance with the inventory

SECTION 16: Other information

NFPA Classification : Health Hazard: 1
Fire Hazard: 2
Reactivity Hazard: 0



Further information

Legacy SDS Number : 398880

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

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.

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

Orfom® MC8 Collector

Version 1.5 Revision Date 2019-01-17

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product information

Product Name : Orfom® MC8 Collector
Material : 1121327, 1122323, 1121613, 1121612, 1121601, 1121600

Company : Chevron Phillips Chemical Company LP
10001 Six Pines Drive
The Woodlands, TX 77380

Emergency telephone:

Health:
866.442.9628 (North America)
1.832.813.4984 (International)
Transport:
CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Mexico CHEMTREC 01-800-681-9531 (24 hours)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600
Argentina: +(54)-1159839431

Responsible Department : Product Safety and Toxicology Group
E-mail address : SDS@CPChem.com
Website : www.CPChem.com

SECTION 2: Hazards identification

Classification of the substance or mixture
This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

Classification

: Flammable liquids, Category 4
Skin irritation, Category 2
Eye irritation, Category 2A
Skin sensitization, Category 1

Labeling

Symbol(s) :

Signal Word : Warning

Hazard Statements : H227: Combustible liquid.
H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.

Precautionary Statements : **Prevention:**
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves/ eye protection/ face protection.
Response:
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
Storage:
P403 + P235 Store in a well-ventilated place. Keep cool.
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Carcinogenicity:

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

SECTION 3: Composition/information on ingredients

Component	CAS-No.	Weight %
tert-Dodecanethiol	25103-58-6	91 - 97
Pine Oil	8002-09-3	3 - 9

SECTION 4: First aid measures

General advice	:	Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.
If inhaled	:	If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
In case of skin contact	:	If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.
In case of eye contact	:	Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	:	Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point	:	83 °C (181 °F)
Suitable extinguishing media	:	Carbon dioxide (CO2).
Unsuitable extinguishing media	:	High volume water jet.
Specific hazards during fire fighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Special protective equipment for fire-fighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.
Fire and explosion protection	:	Do not spray on an open flame or any other incandescent material. Keep away from open flames, hot surfaces and sources of ignition.

SECTION 6: Accidental release measures

Personal precautions	:	Use personal protective equipment. Ensure adequate ventilation.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers

and lakes or drains inform respective authorities.

Methods for cleaning up : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal.

SECTION 7: Handling and storage

Handling

Advice on safe handling : Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Provide sufficient air exchange and/or exhaust in work rooms. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

Advice on protection against fire and explosion : Do not spray on an open flame or any other incandescent material. Keep away from open flames, hot surfaces and sources of ignition.

Storage

Requirements for storage areas and containers : No smoking. Keep in a well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8: Exposure controls/personal protection

Ingredients with workplace control parameters

Chevron Phillips Chemical Company LP

Components	Basis	Value	Control parameters	Note
tert-Dodecanethiol	Manufacturer	TWA	0.1 ppm,	

US

Components	Basis	Value	Control parameters	Note

Hazardous components without workplace control parameters

Engineering measures

Adequate ventilation to control airborned concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

Respiratory protection	:	Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as:. Full-Face Supplied-Air Respirator. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.
Hand protection	:	The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Eye protection	:	Eye wash bottle with pure water. Tightly fitting safety goggles.
Skin and body protection	:	Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate:. Flame retardant protective clothing. Remove and wash contaminated clothing before re-use. Skin should be washed after contact. Footwear protecting against chemicals.
Hygiene measures	:	When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

For additional details, see the Exposure Scenario in the Annex portion

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance

Form	:	Liquid
Physical state	:	Liquid
Color	:	Colorless
Odor	:	pine

Safety data

Flash point	:	83 °C (181 °F)
Boiling point/boiling range	:	193 °C (379 °F)
Density	:	0.879 g/cm3 at 25 °C (77 °F)
Viscosity, kinematic	:	9.38 cSt

SECTION 10: Stability and reactivity

Reactivity : Stable under recommended storage conditions.

Chemical stability : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

Hazardous reactions : Further information: No decomposition if stored and applied as directed.

Hazardous reactions: Vapors may form explosive mixture with air.

Conditions to avoid : Heat, flames and sparks.

Materials to avoid : May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Other data : No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

Orfom® MC8 Collector

Acute oral toxicity : Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method

Acute inhalation toxicity

tert-Dodecanethiol : LC50: > 1.97 mg/l
Exposure time: 4 h
Species: Rat
Sex: male and female
Method: OECD Test Guideline 403
Information given is based on data obtained from similar substances.

Pine Oil LC50: > 20 mg/l
Exposure time: 4 h
Species: Rat
Test atmosphere: dust/mist
Method: OPPTS 870.1300

Acute dermal toxicity

tert-Dodecanethiol : LD50: > 2,000 mg/kg
Species: Rat

	Sex: male Method: OECD Test Guideline 402 Information given is based on data obtained from similar substances.
Pine Oil	LD50: > 5,000 mg/kg Species: Rat Method: OPPTS 870.1200

Acute toxicity (other routes of administration)

Pine Oil :

Orfom® MC8 Collector
Skin irritation : Skin irritation

Orfom® MC8 Collector
Eye irritation : Eye irritation.

Orfom® MC8 Collector
Sensitization : Causes sensitization.

Repeated dose toxicity

tert-Dodecanethiol : Species: Rat, male
Sex: male
Application Route: Inhalation
Dose: 0, 26, 98 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
Lowest observable effect level: 26 ppm
Method: OECD Test Guideline 412
Target Organs: Kidney, Liver

Species: Rat, female
Sex: female
Application Route: Inhalation
Dose: 0, 26, 98 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
NOEL: 26 ppm
Method: OECD Guideline 412
Target Organs: Liver, Kidney

Species: Dog, male and female
Sex: male and female
Application Route: Inhalation
Dose: 0, 25, 106 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
NOEL: 25 ppm
Lowest observable effect level: 109 ppm
Method: OECD Test Guideline 412
Target Organs: Liver

Species: Mouse, male and female
Sex: male and female
Application Route: Inhalation
Dose: 0, 25, 109 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
Lowest observable effect level: 25 ppm
Method: OECD Test Guideline 412
Target Organs: Liver

Species: Rat, male
Sex: male
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg
Exposure time: 35 d
Number of exposures: once daily
NOEL: 50 mg/kg
Method: OECD Guideline 422
Target Organs: Liver, spleen
Information given is based on data obtained from similar substances.

Species: Rat, female
Sex: female
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg
Exposure time: 53 d
Number of exposures: once daily
NOEL: 50 mg/kg
Method: OECD Guideline 422
Target Organs: Liver, spleen
Information given is based on data obtained from similar substances.

Species: Rat, male
Sex: male
Application Route: Inhalation
Dose: 5, 25, 100 ppm
Exposure time: 90 d

Number of exposures: 6h/d, 5d/wk
NOEL: 25 ppm
Method: OECD Test Guideline 413

Species: Rat, female
Sex: female
Application Route: Inhalation
Dose: 5, 25, 100 ppm
Exposure time: 90 d
Number of exposures: 6h/d, 5d/wk
NOEL: 25 ppm
Method: OECD Test Guideline 413

Pine Oil

Species: Rat, male and female
Sex: male and female
Application Route: Dermal
Dose: 50, 113, 226 mg/kg/d
Exposure time: 13 wk
Number of exposures: 5 d/wk
NOEL: > 226 mg/kg

Genotoxicity in vitro

tert-Dodecanethiol : Test Type: Ames test
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Test Type: Mouse lymphoma assay
Metabolic activation: with and without metabolic activation
Method: OECD Guideline 476
Result: negative

Test Type: Sister Chromatid Exchange Assay
Metabolic activation: with and without metabolic activation
Method: OECD Guideline 479
Result: negative

Test Type: Chromosome aberration test in vitro
Metabolic activation: with and without metabolic activation
Method: OECD Guideline 473
Result: Ambiguous

Genotoxicity in vivo

tert-Dodecanethiol : Test Type: In vivo micronucleus test
Species: Mouse
Route of Application: Oral
Dose: 1250, 2500, 5000 mg/kg/bw
Method: Mutagenicity (micronucleus test)
Result: negative
Remarks: Information given is based on data obtained from similar substances.

Reproductive toxicity

tert-Dodecanethiol : Species: Rat
Sex: male

Application Route: oral gavage
Dose: 10, 50, 250 mg/kg/d
Exposure time: 35 d
Number of exposures: Daily
Method: OECD Guideline 422
NOAEL Parent: >= 250 mg/kg
Information given is based on data obtained from similar substances.

Species: Rat
Sex: female
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg/d
Exposure time: 53 d
Number of exposures: Daily
Method: OECD Guideline 422
NOAEL Parent: 50 mg/kg
NOAEL F1: 50 mg/kg
Information given is based on data obtained from similar substances.
Decrease in Delivery Index

Developmental Toxicity

tert-Dodecanethiol : Species: Rat
Application Route: Inhalation
Dose: 0, 22.7, 88.6 ppm
Number of exposures: 6 hrs/d
Test period: GD 6-19
Method: OECD Guideline 414
NOAEL Teratogenicity: >= 88.6 ppm
No adverse effects expected

Species: Mouse
Application Route: Inhalation
Dose: 0, 22.7, 88.6 ppm
Number of exposures: 6 hrs/d
Test period: GD 6-19
Method: OECD Guideline 414
NOAEL Teratogenicity: >= 88.6 ppm
No adverse effects expected

Pine Oil Species: Rat
Application Route: oral gavage
Dose: 50, 600, 1200 mg/kg/d
Exposure time: GD 6 - 15
Number of exposures: Daily
NOAEL Teratogenicity: 50 mg/kg
NOAEL Maternal: 50 mg/kg

Orfom® MC8 Collector
Aspiration toxicity : May be harmful if swallowed and enters airways.

CMR effects

tert-Dodecanethiol : Carcinogenicity: Not available
Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Teratogenicity: Animal testing did not show any effects on

fetal development.
Reproductive toxicity: No toxicity to reproduction

Orfom® MC8 Collector
Further information : Solvents may degrease the skin.

SECTION 12: Ecological information

Ecotoxicity effects
Toxicity to fish

tert-Dodecanethiol	: LL50: > 100 mg/l Exposure time: 96 h Species: Danio rerio (Zebra Fish) static test Method: OECD Test Guideline 203 No toxicity at the limit of solubility.
Pine Oil	18.4 mg/l Exposure time: 96 h Species: Oncorhynchus mykiss (rainbow trout) flow-through test Method: OPPTS 850.1075

Toxicity to daphnia and other aquatic invertebrates

tert-Dodecanethiol	: EC50: > 0.056 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) semi-static test Method: OECD Test Guideline 202 No toxicity at the limit of solubility.
Pine Oil	24.5 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) flow-through test Method: OPPTS 850.1010

Toxicity to bacteria

tert-Dodecanethiol	: NOEC: 8.6 mg/l Exposure time: 3 h Growth rate Respiration inhibition Method: OECD Test Guideline 209 NOEC: > 10 mg/l Exposure time: 3 h Growth rate Respiration inhibition Method: OECD Test Guideline 209

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

tert-Dodecanethiol	: NOEC: 0.0108 mg/l Exposure time: 21 d

Species: Daphnia magna (Water flea)
semi-static test
Method: OECD Test Guideline 211
No toxicity at the limit of solubility.

Biodegradability

tert-Dodecanethiol : Result: Not readily biodegradable.
0 %
Testing period: 28 d
Method: OECD Test Guideline 301D

Pine Oil : This material is expected to be readily biodegradable.

Elimination information (persistence and degradability)

Bioaccumulation

tert-Dodecanethiol : Species: Danio rerio (zebra fish)
Exposure time: 15 d
Bioconcentration factor (BCF): > 500 - < 1,950
Method: OECD Test Guideline 305
Biomagnification factor <1
The product may be accumulated in organisms.

Pine Oil : No data available

Mobility : No data available

Results of PBT assessment
tert-Dodecanethiol : Non-classified PBT substance, Non-classified vPvB substance

Additional ecological information : May cause long lasting harmful effects to aquatic life.

Ecotoxicology Assessment

Short-term (acute) aquatic hazard
tert-Dodecanethiol : No toxicity at the limit of solubility.

Pine Oil : Harmful to aquatic life.

Long-term (chronic) aquatic hazard
tert-Dodecanethiol : May cause long lasting harmful effects to aquatic life.

Pine Oil : Harmful to aquatic life with long lasting effects.

Toxicity Data on Soil
tert-Dodecanethiol : Adsorbs on soil.

SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product	:	The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

For additional details, see the Exposure Scenario in the Annex portion

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)
UN1268, PETROLEUM DISTILLATES, N.O.S., COMBUSTIBLE LIQUID, III

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (PINE OIL), 9, III, (83 °C), MARINE POLLUTANT, (PINE OIL)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN3334, AVIATION REGULATED LIQUID, N.O.S., (TERT-DODECANETHIOL), 9, III

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

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

SECTION 15: Regulatory information

National legislation

SARA 311/312 Hazards : Flammable (gases, aerosols, liquids, or solids)
Serious eye damage or eye irritation
Respiratory or skin sensitization
Skin corrosion or irritation

EPCRA - EMERGENCY PLANNING COMMUNITY RIGHT - TO – KNOW

CERCLA Reportable Quantity	:	This material does not contain any components with a CERCLA RQ.
SARA 302 Reportable Quantity	:	This material does not contain any components with a SARA 302 RQ.
SARA 302 Threshold Planning Quantity	:	No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
SARA 304 Reportable Quantity	:	This material does not contain any components with a section 304 EHS RQ.
SARA 313 Components	:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

Ozone-Depletion Potential	:	This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

US State Regulations

Pennsylvania Right To Know : tert-Dodecanethiol - 25103-58-6

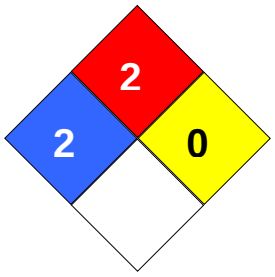
California Prop. 65 Components : This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

Notification status

Europe REACH	:	A substance or substances in this product is not registered or notified to be registered. Importation or manufacture of this product is still permitted provided that it does not exceed the REACH minimum threshold quantity of the non-regulated substances.
United States of America (USA) TSCA	:	On TSCA Inventory
Switzerland CH INV	:	On the inventory, or in compliance with the inventory
Canada DSL	:	All components of this product are on the Canadian DSL
Australia AICS	:	On the inventory, or in compliance with the inventory
New Zealand NZIoC	:	On the inventory, or in compliance with the inventory
Japan ENCS	:	On the inventory, or in compliance with the inventory
Korea KECI	:	On the inventory, or in compliance with the inventory
Philippines PICCS	:	On the inventory, or in compliance with the inventory
China IECSC	:	On the inventory, or in compliance with the inventory

SECTION 16: Other information

NFPA Classification : Health Hazard: 2
Fire Hazard: 2
Reactivity Hazard: 0



Further information

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

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.

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

Orfom® MC17 Collector

Version 1.0 Revision Date 2019-12-12

according to GB/T 16483 and GB/T 17519

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product information

Product Name : Orfom® MC17 Collector
Material : 1122712, 1122623, 1119870, 1119869, 1119868, 1119860, 1119867, 1119866, 1119861, 1119859

Company : Chevron Phillips Chemical Company LP
10001 Six Pines Drive
The Woodlands, TX 77380

Emergency telephone:

Health:
866.442.9628 (North America)
1.832.813.4984 (International)
Transport:
CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Mexico CHEMTREC 01-800-681-9531 (24 hours)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600
Argentina: +(54)-1159839431

Responsible Department : Product Safety and Toxicology Group
E-mail address : SDS@CPChem.com
Website : www.CPChem.com

SECTION 2: Hazards identification

Classification of the substance or mixture
GHS Classification and Labeling: Follow GB 13690, GB 15258 and GB 30000.2 to GB 30000.29 (GHS 2011)

Emergency Overview

Danger

Physical state: Liquid **Color**: Colorless **Odor**: mild hydrocarbon

Hazards : Combustible liquid. Causes skin irritation. Causes serious eye irritation. May cause an allergic skin reaction. May be fatal if swallowed and enters airways. May cause long lasting harmful

effects to aquatic life.

Classification

: Flammable liquids, Category 4
Skin corrosion/irritation, Category 2
Serious eye damage/eye irritation, Category 2A
Skin sensitization, Category 1
Aspiration hazard, Category 1
Long-term (chronic) aquatic hazard, Category 4

Labeling

Symbol(s) :

Signal Word : Danger

Hazard Statements : H227: Combustible liquid.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H413: May cause long lasting harmful effects to aquatic life.

Precautionary Statements : **Prevention:**
P210: Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P261: Avoid breathing dust/fume/gas/mist/vapors/spray.
P264: Wash skin thoroughly after handling.
P273: Avoid release to the environment.
P280: Wear protective gloves/ eye protection/ face protection.
Response:
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P302 + P352: IF ON SKIN: Wash with plenty of water.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P331: Do NOT induce vomiting.
P333 + P313: If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313: If eye irritation persists: Get medical advice/ attention.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
Storage:
P403 + P235: Store in a well-ventilated place. Keep cool.
Disposal:
P501: Dispose of contents/ container to an approved waste disposal plant.

SECTION 3: Composition/information on ingredients

Synonyms : Orfom® MC17a Collector

Chemical name	CAS-No. / EINECS-No.	Concentration [wt%]
tert-Dodecanethiol	25103-58-6	20 - 80
C13-C16 Isoalkanes	68551-20-2	20 - 80
C12-C14 Isoalkanes	68551-19-9	20 - 80

SECTION 4: First aid measures

General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.

If inhaled : If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.

In case of skin contact : If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact : Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point : 79°C (175°F)

Suitable extinguishing media : Carbon dioxide (CO2).

Unsuitable extinguishing media : High volume water jet.

Specific hazards during fire fighting : Do not allow run-off from fire fighting to enter drains or water courses.

Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.

Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.

Fire and explosion protection	:	Do not spray on an open flame or any other incandescent material. Keep away from open flames, hot surfaces and sources of ignition.
Hazardous decomposition products	:	Carbon oxides. Sulfur oxides.

SECTION 6: Accidental release measures

Personal precautions	:	Use personal protective equipment. Ensure adequate ventilation.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods for cleaning up	:	Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal.

SECTION 7: Handling and storage

Handling

Advice on safe handling	:	Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Provide sufficient air exchange and/or exhaust in work rooms. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
Advice on protection against fire and explosion	:	Do not spray on an open flame or any other incandescent material. Keep away from open flames, hot surfaces and sources of ignition.

Storage

Requirements for storage areas and containers	:	No smoking. Keep in a well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8: Exposure controls/personal protection

Ingredients with workplace control parameters

Chevron Phillips Chemical Company LP

Components	Basis	Value	Control parameters	Note
tert-Dodecanethiol	Manufacturer	TWA	0.1 ppm,	
C12-C14 Isoalkanes	Manufacturer	TWA	1,200 mg/m3	RCP,

RCP Reciprocal Calculation Procedure

CN

Components	Basis	Value	Control parameters	Note

Not applicable

Engineering measures

Adequate ventilation to control airborned concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

Respiratory protection : Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as:. Full-Face Air-Purifying Respirator for Organic Vapors, Dusts and Mists. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Hand protection : The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection : Eye wash bottle with pure water. Tightly fitting safety goggles.

Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate:. Flame retardant protective clothing. Remove and wash contaminated clothing before re-use. Skin should be washed after contact. Footwear protecting against chemicals.

Hygiene measures : When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance

Physical state	:	Liquid
Color	:	Colorless
Odor	:	mild hydrocarbon

Safety data

Flash point	:	79°C (175°F)
Lower explosion limit	:	No data available
Upper explosion limit	:	No data available
Molecular weight	:	202.44 g/mol
pH	:	Not applicable
Pour point	:	No data available
Boiling point/boiling range	:	233°C (451°F)
Vapor pressure	:	4.00 Pa at 24°C (75°F)
Relative density	:	0.80 at 16 °C (61 °F)
Density	:	6.7 L/G
Water solubility	:	No data available
Partition coefficient: n-octanol/water	:	Pow: 7.43 at 20°C (68°F)
Viscosity, dynamic	:	2.6 cP at 20°C (68°F)
Viscosity, kinematic	:	No data available
Relative vapor density	:	3 (Air = 1.0)
Evaporation rate	:	< 1

SECTION 10: Stability and reactivity

Chemical stability : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

Hazardous reactions : Further information: No decomposition if stored and applied as directed.

Hazardous reactions: Vapors may form explosive mixture with

air.

Conditions to avoid : Heat, flames and sparks.

Hazardous decomposition products : Carbon oxides
Sulfur oxides

Other data : No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

Acute oral toxicity

tert-Dodecanethiol	: LD50: > 2,000 mg/kg Species: Rat Sex: female Method: OECD Test Guideline 423
C13-C16 Isoalkanes	LD50: > 5,000 mg/kg Species: Rat Sex: male and female Method: OECD Test Guideline 401 Information given is based on data obtained from similar substances.
C12-C14 Isoalkanes	LD50: > 5,000 mg/kg Species: Rat Sex: male and female Method: OECD Test Guideline 401 Information given is based on data obtained from similar substances.

Acute inhalation toxicity

tert-Dodecanethiol	: LC50: > 1.97 mg/l Exposure time: 4 h Species: Rat Sex: male and female Method: OECD Test Guideline 403 Information given is based on data obtained from similar substances.
C13-C16 Isoalkanes	LC50: > 5.3 mg/l Exposure time: 4 h Species: Rat Sex: male and female Test atmosphere: dust/mist Method: OECD Test Guideline 403 An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration. Information given is based on data obtained from similar substances.
C12-C14 Isoalkanes	LC50: > 5.3 mg/l Exposure time: 4 h Species: Rat Sex: male and female

Test atmosphere: dust/mist
Method: OECD Test Guideline 403
An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration.
Information given is based on data obtained from similar substances.

Acute dermal toxicity

tert-Dodecanethiol : LD50: > 2,000 mg/kg
Species: Rat
Sex: male
Method: OECD Test Guideline 402
Information given is based on data obtained from similar substances.

C13-C16 Isoalkanes LD50: > 2,000 mg/kg
Species: Rabbit
Sex: male and female
Method: OECD Test Guideline 402
Information given is based on data obtained from similar substances.

Orfom® MC17 Collector
Skin irritation : Irritating to skin.
largely based on animal evidence.

Orfom® MC17 Collector
Eye irritation : Irritating to eyes.
largely based on animal evidence.

Orfom® MC17 Collector
Sensitization : Causes sensitization.
largely based on animal evidence.

Repeated dose toxicity

tert-Dodecanethiol : Species: Rat, male
Sex: male
Application Route: Inhalation
Dose: 0, 26, 98 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
Lowest observable effect level: 26 ppm
Method: OECD Test Guideline 412
Target Organs: Kidney, Liver

Species: Rat, female
Sex: female
Application Route: Inhalation
Dose: 0, 26, 98 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
NOEL: 26 ppm
Method: OECD Guideline 412
Target Organs: Liver, Kidney

Species: Dog, male and female
Sex: male and female
Application Route: Inhalation
Dose: 0, 25, 106 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
NOEL: 25 ppm
Lowest observable effect level: 109 ppm
Method: OECD Test Guideline 412
Target Organs: Liver

Species: Mouse, male and female
Sex: male and female
Application Route: Inhalation
Dose: 0, 25, 109 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
Lowest observable effect level: 25 ppm
Method: OECD Test Guideline 412
Target Organs: Liver

Species: Rat, male
Sex: male
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg
Exposure time: 35 d
Number of exposures: once daily
NOEL: 50 mg/kg
Method: OECD Guideline 422
Target Organs: Liver, spleen
Information given is based on data obtained from similar substances.

Species: Rat, female
Sex: female
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg
Exposure time: 53 d
Number of exposures: once daily
NOEL: 50 mg/kg
Method: OECD Guideline 422
Target Organs: Liver, spleen
Information given is based on data obtained from similar substances.

Species: Rat, male
Sex: male
Application Route: Inhalation
Dose: 5, 25, 100 ppm
Exposure time: 90 d

	Number of exposures: 6h/d, 5d/wk NOEL: 25 ppm Method: OECD Test Guideline 413 Species: Rat, female Sex: female Application Route: Inhalation Dose: 5, 25, 100 ppm Exposure time: 90 d Number of exposures: 6h/d, 5d/wk NOEL: 25 ppm Method: OECD Test Guideline 413
C13-C16 Isoalkanes	Species: Rat, male and female Sex: male and female Application Route: oral gavage Exposure time: 13 wk Number of exposures: 7 d/wk NOEL: > 5,000 mg/kg Method: OECD Test Guideline 408 No significant adverse effects were reported Information given is based on data obtained from similar substances. Species: Rat, male and female Sex: male and female Application Route: Inhalation Exposure time: 13 wk Number of exposures: 6 h/d NOEL: 30 mg/l Method: OECD Test Guideline 413 No significant adverse effects were reported Information given is based on data obtained from similar substances. Species: Rat, male and female Sex: male and female Application Route: Dermal Exposure time: 13 wk Number of exposures: 5 d/wk NOEL: > 495 mg/kg Method: OECD Test Guideline 411 No significant adverse effects were reported Information given is based on data obtained from similar substances.
C12-C14 Isoalkanes	Species: Rat, male and female Sex: male and female Application Route: oral gavage Dose: 500, 2500, 5000 mg/kg/d Exposure time: 13 wk Number of exposures: daily NOEL: >= 5000 mg/kg/d Method: OECD Test Guideline 408 No adverse effects expected Information given is based on data obtained from similar substances.

Species: Rat, male and female
Sex: male and female
Application Route: Dermal
Dose: 165, 330, 495 mg/kg
Exposure time: 13 wk
Number of exposures: 5 d/wk
NOEL: > 495 mg/kg/d
Method: OECD Guideline 411
No adverse effects expected
Information given is based on data obtained from similar substances.

Species: Rat, male and female
Sex: male and female
Application Route: Inhalation
Dose: 5, 10, 30 mg/L
Exposure time: 90 d
Number of exposures: 6 h/d
NOEL: > 30 mg/l
Method: OECD Test Guideline 413
No adverse effects expected
Information given is based on data obtained from similar substances.

Genotoxicity in vitro

tert-Dodecanethiol	:	Test Type: Ames test Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative Test Type: Mouse lymphoma assay Metabolic activation: with and without metabolic activation Method: OECD Guideline 476 Result: negative Test Type: Sister Chromatid Exchange Assay Metabolic activation: with and without metabolic activation Method: OECD Guideline 479 Result: negative Test Type: Chromosome aberration test in vitro Metabolic activation: with and without metabolic activation Method: OECD Guideline 473 Result: Ambiguous
C13-C16 Isoalkanes		Test Type: Reverse mutation assay Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative Remarks: Information given is based on data obtained from similar substances.

	Test Type: Cytogenetic assay Test system: Chinese hamster cells Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 473 Result: negative Remarks: Information given is based on data obtained from similar substances. Test Type: Mouse lymphoma assay Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 476 Result: negative Remarks: Information given is based on data obtained from similar substances.
C12-C14 Isoalkanes	Test Type: Ames test Metabolic activation: with and without metabolic activation Result: negative Test Type: Mouse lymphoma assay Metabolic activation: with and without metabolic activation Result: negative Test Type: Sister Chromatid Exchange Assay Metabolic activation: with and without metabolic activation Result: negative

Genotoxicity in vivo

tert-Dodecanethiol	:	Test Type: In vivo micronucleus test Species: Mouse Route of Application: Oral Dose: 1250, 2500, 5000 mg/kg/bw Method: Mutagenicity (micronucleus test) Result: negative Remarks: Information given is based on data obtained from similar substances.

Reproductive toxicity

tert-Dodecanethiol	:	Species: Rat Sex: male Application Route: oral gavage Dose: 10, 50, 250 mg/kg/d Exposure time: 35 d Number of exposures: Daily Method: OECD Guideline 422 NOAEL Parent: >= 250 mg/kg Information given is based on data obtained from similar substances.

	Species: Rat Sex: female Application Route: oral gavage Dose: 10, 50, 250 mg/kg/d Exposure time: 53 d Number of exposures: Daily Method: OECD Guideline 422 NOAEL Parent: 50 mg/kg NOAEL F1: 50 mg/kg Information given is based on data obtained from similar substances. Decrease in Delivery Index
C13-C16 Isoalkanes	Species: Rat Sex: male and female Application Route: oral gavage Dose: 50, 100, 750 mg/kd/d Exposure time: 70 d Number of exposures: Daily Method: OECD Test Guideline 416 NOAEL Parent: >= 750 mg/kg NOAEL F1: >= 750 mg/kg No adverse effects expected Information given is based on data obtained from similar substances.
C12-C14 Isoalkanes	Species: Rat Sex: male and female Application Route: oral gavage Dose: 50, 200, 750 mg/kg/bw/d Number of exposures: daily Test period: 70 d Method: OECD Test Guideline 416 NOAEL Parent: >750 mg/kg/bw/d NOAEL F1: >750 mg/kg/bw/d No adverse effects expected Information given is based on data obtained from similar substances.

Developmental Toxicity

tert-Dodecanethiol	:	Species: Rat Application Route: Inhalation Dose: 0, 22.7, 88.6 ppm Number of exposures: 6 hrs/d Test period: GD 6-19 Method: OECD Guideline 414 NOAEL Teratogenicity: >= 88.6 ppm No adverse effects expected Species: Mouse Application Route: Inhalation Dose: 0, 22.7, 88.6 ppm Number of exposures: 6 hrs/d Test period: GD 6-19 Method: OECD Guideline 414 NOAEL Teratogenicity: >= 88.6 ppm No adverse effects expected

Orfom® MC17 Collector
Aspiration toxicity : May be fatal if swallowed and enters airways.

CMR effects

tert-Dodecanethiol	:	Carcinogenicity: Not available Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Teratogenicity: Animal testing did not show any effects on fetal development. Reproductive toxicity: No toxicity to reproduction
C13-C16 Isoalkanes		Carcinogenicity: Not available Mutagenicity: In vitro tests did not show mutagenic effects Reproductive toxicity: No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.
C12-C14 Isoalkanes		Carcinogenicity: Not available Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects., In vivo tests did not show mutagenic effects Teratogenicity: Animal testing did not show any effects on fetal development. Reproductive toxicity: Animal testing did not show any effects on fertility.

Orfom® MC17 Collector
Further information : Solvents may degrease the skin.

SECTION 12: Ecological information

Toxicity to fish

tert-Dodecanethiol	:	LL50: > 100 mg/l Exposure time: 96 h Species: Danio rerio (Zebra Fish) static test Method: OECD Test Guideline 203

No toxicity at the limit of solubility.

C13-C16 Isoalkanes
LL50: > 1,000 mg/l
Exposure time: 96 h
Species: Oncorhynchus mykiss (rainbow trout)
static test Method: OECD Test Guideline 203
Information given is based on data obtained from similar substances.

C12-C14 Isoalkanes
LL50: > 1,000 mg/l
Exposure time: 96 h
Species: Oncorhynchus mykiss (rainbow trout)
semi-static test Method: OECD Test Guideline 203
Information given is based on data obtained from similar substances.

Toxicity to daphnia and other aquatic invertebrates

tert-Dodecanethiol : EC50: > 0.056 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
semi-static test Method: OECD Test Guideline 202
No toxicity at the limit of solubility.

C13-C16 Isoalkanes
EL50: > 1,000 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
Immobilization Method: OECD Test Guideline 202
Information given is based on data obtained from similar substances.

C12-C14 Isoalkanes
LL50: > 3,000 mg/l
Exposure time: 48 h
Species: Acartia tonsa (Marine Copepod)
static test Method: ISO 14669 and PARCOM method
Information given is based on data obtained from similar substances.

Toxicity to algae

C13-C16 Isoalkanes : EL50: > 1,000 mg/l
Exposure time: 72 h
Species: Pseudokirchneriella subcapitata (green algae)
Growth inhibition Method: OECD Test Guideline 201
Information given is based on data obtained from similar substances.

C12-C14 Isoalkanes
EL50: > 1,000 mg/l
Exposure time: 72 h
Species: Pseudokirchneriella subcapitata (green algae)
Growth inhibition Method: OECD Test Guideline 201
Information given is based on data obtained from similar substances.

Toxicity to bacteria

tert-Dodecanethiol	:	NOEC: 8.6 mg/l Exposure time: 3 h Growth rate Respiration inhibition Method: OECD Test Guideline 209 NOEC: > 10 mg/l Exposure time: 3 h Growth rate Respiration inhibition Method: OECD Test Guideline 209
C13-C16 Isoalkanes		> 100 mg/l Exposure time: 3 h Respiration inhibition Method: OECD Test Guideline 209 Information given is based on data obtained from similar substances.

Toxicity to fish (Chronic toxicity)

C12-C14 Isoalkanes	:	No data available:

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

tert-Dodecanethiol	:	NOEC: 0.0108 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) semi-static test Method: OECD Test Guideline 211 No toxicity at the limit of solubility.
C12-C14 Isoalkanes	:	No data available
Biodegradability	:	Taking into consideration the properties of several ingredients, the product is estimated not to be readily biodegradable according to OECD classification.

Elimination information (persistence and degradability)

Bioaccumulation

tert-Dodecanethiol	:	Species: Danio rerio (zebra fish) Exposure time: 15 d Bioconcentration factor (BCF): > 500 - < 1,950 Method: OECD Test Guideline 305 Biomagnification factor <1 The product may be accumulated in organisms.

Mobility

C13-C16 Isoalkanes	:	immobile

Results of PBT assessment

tert-Dodecanethiol	:	Non-classified PBT substance, Non-classified vPvB substance

C13-C16 Isoalkanes	:	Non-classified PBT substance, Non-classified vPvB substance
C12-C14 Isoalkanes	:	Non-classified PBT substance, Non-classified vPvB substance
Additional ecological information	:	May cause long lasting harmful effects to aquatic life.

Ecotoxicology Assessment

Short-term (acute) aquatic hazard

tert-Dodecanethiol	:	No toxicity at the limit of solubility.
C13-C16 Isoalkanes	:	This product has no known ecotoxicological effects.
C12-C14 Isoalkanes	:	This product has no known ecotoxicological effects.

Long-term (chronic) aquatic hazard

tert-Dodecanethiol	:	May cause long lasting harmful effects to aquatic life.
C13-C16 Isoalkanes	:	This product has no known ecotoxicological effects.
C12-C14 Isoalkanes	:	This product has no known ecotoxicological effects.
Toxicity Data on Soil	:	No information available.
Other organisms relevant to the environment	:	No information available.
Impact on Sewage Treatment	:	No information available.

SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product	:	The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping

description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

Testing (ASTM D4206) has shown product does not sustain combustion.

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

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

SECTION 15: Regulatory information

Notification status

Europe REACH	:	This mixture contains only ingredients which have been registered according to Regulation (EU) No. 1907/2006 (REACH).
Switzerland CH INV	:	On the inventory, or in compliance with the inventory
United States of America (USA) TSCA	:	On or in compliance with the active portion of the TSCA inventory
Canada DSL	:	All components of this product are on the Canadian DSL
Australia AICS	:	On the inventory, or in compliance with the inventory
New Zealand NZIoC	:	On the inventory, or in compliance with the inventory

Japan ENCS	:	On the inventory, or in compliance with the inventory
Korea KECI	:	A substance(s) in this product was not registered, notified to be registered, or exempted from registration by CPChem according to K-REACH regulations. Importation or manufacture of this product is still permitted provided the Korean Importer of Record has themselves notified the substance.
Philippines PICCS	:	Not in compliance with the inventory
China IECSC	:	On the inventory, or in compliance with the inventory
Taiwan TCSI	:	On the inventory, or in compliance with the inventory
Other regulations	:	Law on the Prevention and Control of Occupational Diseases

SECTION 16: Other information

Further information

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

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.

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical	TWA	Time Weighted Average

	Substances in China		
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

Orfom® MC 37 Collector

Version 2.4 Revision Date 2020-01-13

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product information

Product Name : Orfom® MC 37 Collector
Material : 1119737, 1119735, 1119734, 1119733, 1119732, 1119711, 1108011, 1106092, 1106090, 1106089, 1106091, 1105818

Use : Mineral Collector

Company : Chevron Phillips Chemical Company LP
Mining Chemicals
10001 Six Pines Drive
The Woodlands, TX 77380

Emergency telephone:

Health:
866.442.9628 (North America)
1.832.813.4984 (International)
Transport:
CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Mexico CHEMTREC 01-800-681-9531 (24 hours)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600
Argentina: +(54)-1159839431

Responsible Department : Product Safety and Toxicology Group
E-mail address : SDS@CPChem.com
Website : www.CPChem.com

This product is for experimental uses only. The product has not been completely analyzed and all of the hazards may not be known. Please use caution while handling this product.

SECTION 2: Hazards identification

Classification of the substance or mixture

This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

Classification

: Flammable liquids, Category 4
Skin irritation, Category 2

Eye irritation, Category 2A
Skin sensitization, Category 1
Carcinogenicity, Category 1B
Reproductive toxicity, Category 2
Specific target organ toxicity - repeated exposure, Category 2, Blood, Liver, thymus gland
Aspiration hazard, Category 1

Labeling

Symbol(s) :

Signal Word : Danger

Hazard Statements : H227: Combustible liquid.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H350: May cause cancer.
H361: Suspected of damaging fertility or the unborn child.
H373: May cause damage to organs (Blood, Liver, thymus gland) through prolonged or repeated exposure.

Precautionary Statements : **Prevention:**
P201 Obtain special instructions before use.
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P302 + P352 IF ON SKIN: Wash with plenty of water.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P311 Call a POISON CENTER or doctor/ physician.
P331 Do NOT induce vomiting.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P370 + P378 In case of fire: Use alcohol-resistant foam, carbon dioxide or water mist to extinguish.
Storage:
P403 + P235 Store in a well-ventilated place. Keep cool.
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Carcinogenicity:

IARC	Group 2B: Possibly carcinogenic to humans	
	Decant (clarified) Oils	64741-62-4
	Light Cycle Oil	64741-59-9
NTP	Known to be human carcinogen	
	Light Cycle Oil	64741-59-9

SECTION 3: Composition/information on ingredients

Synonyms : None Established

Molecular formula : Mixture

Component	CAS-No.	Weight %
Light Cycle Oil	64741-59-9	25 - 75
tert-Dodecanethiol	25103-58-6	25 - 75
Decant (clarified) Oils	64741-62-4	25 - 75

This is an experimental material: The composition of this material may vary.

SECTION 4: First aid measures

General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.

If inhaled : Consult a physician after significant exposure. If unconscious, place in recovery position and seek medical advice.

In case of skin contact : If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact : Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point : 93°C (199°F)

Autoignition temperature : 260°C (500°F)

Suitable extinguishing media : Carbon dioxide (CO2).

Unsuitable extinguishing media : High volume water jet.

Specific hazards during fire fighting : Do not allow run-off from fire fighting to enter drains or water courses.

Special protective equipment for fire-fighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.
Fire and explosion protection	:	Do not spray on an open flame or any other incandescent material. Keep away from open flames, hot surfaces and sources of ignition.
Hazardous decomposition products	:	Carbon oxides. Sulfur oxides.

SECTION 6: Accidental release measures

Personal precautions	:	Use personal protective equipment. Ensure adequate ventilation.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods for cleaning up	:	Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal.

SECTION 7: Handling and storage

Handling

Advice on safe handling	:	Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Provide sufficient air exchange and/or exhaust in work rooms. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
Advice on protection against fire and explosion	:	Do not spray on an open flame or any other incandescent material. Keep away from open flames, hot surfaces and sources of ignition.

Storage

Requirements for storage areas and containers	:	No smoking. Keep in a well-ventilated place. Containers which are opened must be carefully resealed and kept upright

to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

Use : Mineral Collector

SECTION 8: Exposure controls/personal protection

Ingredients with workplace control parameters

Chevron Phillips Chemical Company LP

Components	Basis	Value	Control parameters	Note
tert-Dodecanethiol	Manufacturer	TWA	0.1 ppm,	

US

Components	Basis	Value	Control parameters	Note

Hazardous components without workplace control parameters

Engineering measures

Adequate ventilation to control airborned concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

Respiratory protection : Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as:. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Hand protection : The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection : Eye wash bottle with pure water. Tightly fitting safety goggles.

Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate:. Flame retardant protective clothing. Remove and wash contaminated clothing before re-use. Skin should be washed after contact. Footwear protecting against chemicals.

Hygiene measures : When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance

Physical state	:	Liquid
Color	:	Dark Brown
Odor	:	Pungent

Safety data

Flash point	:	93°C (199°F)
Lower explosion limit	:	0.6 %(V)
Oxidizing properties	:	no
Autoignition temperature	:	260°C (500°F)
Molecular formula	:	Mixture
Molecular weight	:	Not applicable
pH	:	Not applicable
Pour point	:	No data available
Boiling point/boiling range	:	110-427°C (230-801°F)
Vapor pressure	:	1.00 MMHG at 25°C (77°F)
Relative density	:	No data available
Density	:	0.9529 g/cm3
Water solubility	:	Negligible
Partition coefficient: n-octanol/water	:	No data available
Viscosity, kinematic	:	No data available
Relative vapor density	:	1 (Air = 1.0)
Evaporation rate	:	< 1

SECTION 10: Stability and reactivity

Chemical stability : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

Hazardous reactions : Hazardous reactions: Hazardous polymerization does not occur.

Further information: No decomposition if stored and applied as directed.

Hazardous reactions: Vapors may form explosive mixture with air.

Conditions to avoid : Heat, flames and sparks.

Hazardous decomposition products : Carbon oxides
Sulfur oxides

Other data : No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

THE TOXICITY OF THIS MATERIAL HAS NOT BEEN FULLY ASSESSED
Since this is an experimental material, limited data are available regarding potential health effects following exposure to it. Therefore, we strongly recommend that this document be read carefully and the precautions outlined in it be followed to minimize exposure.
This product is for experimental uses only. The product has not been completely analyzed and all of the hazards may not be known. Please use caution while handling this product.

Orfom® MC 37 Collector
Acute oral toxicity : LD50: > 3,000 mg/kg
Method: Acute toxicity estimate

Orfom® MC 37 Collector
Acute inhalation toxicity : LC50: > 14 mg/l
Exposure time: 4 h
Test atmosphere: vapor
Method: Acute toxicity estimate

Orfom® MC 37 Collector
Acute dermal toxicity : LD50: > 3,000 mg/kg
Method: Acute toxicity estimate

Orfom® MC 37 Collector
Skin irritation : Skin irritation

Orfom® MC 37 Collector
Eye irritation : Eye irritation

Orfom® MC 37 Collector
Sensitization : Causes sensitization.

Repeated dose toxicity

Light Cycle Oil	:	Species: Rat, males Sex: males Application Route: Dermal Dose: 0, 8, 25, 125, 500, 1250 mg/kg Exposure time: 90 day Number of exposures: 5 days/wk NOEL: 25 mg/kg Target Organs: Blood, Liver, Thymus Species: Rat, females Sex: females Application Route: Dermal Dose: 0, 8, 25, 125, 500, 1250 mg/kg Exposure time: 90 day Number of exposures: 5 days/wk NOEL: 125 mg/kg Target Organs: Blood, Liver, Thymus
tert-Dodecanethiol		Species: Rat, male Sex: male Application Route: Inhalation Dose: 0, 26, 98 ppm Exposure time: 4 wk Number of exposures: 6 h/d, 5 d/wk Lowest observable effect level: 26 ppm Method: OECD Test Guideline 412 Target Organs: Kidney, Liver

Species: Rat, female
Sex: female
Application Route: Inhalation
Dose: 0, 26, 98 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
NOEL: 26 ppm
Method: OECD Guideline 412
Target Organs: Liver, Kidney

Species: Dog, male and female
Sex: male and female
Application Route: Inhalation
Dose: 0, 25, 106 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
NOEL: 25 ppm
Lowest observable effect level: 109 ppm
Method: OECD Test Guideline 412
Target Organs: Liver

Species: Mouse, male and female
Sex: male and female
Application Route: Inhalation
Dose: 0, 25, 109 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
Lowest observable effect level: 25 ppm
Method: OECD Test Guideline 412
Target Organs: Liver

Species: Rat, male
Sex: male
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg
Exposure time: 35 d
Number of exposures: once daily
NOEL: 50 mg/kg
Method: OECD Guideline 422
Target Organs: Liver, spleen
Information given is based on data obtained from similar substances.

Species: Rat, female
Sex: female
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg
Exposure time: 53 d
Number of exposures: once daily
NOEL: 50 mg/kg
Method: OECD Guideline 422
Target Organs: Liver, spleen
Information given is based on data obtained from similar substances.

Species: Rat, male
Sex: male
Application Route: Inhalation
Dose: 5, 25, 100 ppm
Exposure time: 90 d

	Number of exposures: 6h/d, 5d/wk NOEL: 25 ppm Method: OECD Test Guideline 413 Species: Rat, female Sex: female Application Route: Inhalation Dose: 5, 25, 100 ppm Exposure time: 90 d Number of exposures: 6h/d, 5d/wk NOEL: 25 ppm Method: OECD Test Guideline 413
Decant (clarified) Oils	Species: Rat Application Route: Dermal Dose: 0, 8, 30, 125, 500 mg/kg Exposure time: 13 wk Lowest observable effect level: 8 mg/kg Target Organs: Liver

Genotoxicity in vitro

Light Cycle Oil	:	Test Type: Modified Ames test Result: positive Test Type: Mouse lymphoma assay Result: positive Test Type: Sister Chromatid Exchange Assay Result: negative
tert-Dodecanethiol		Test Type: Ames test Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative Test Type: Mouse lymphoma assay Metabolic activation: with and without metabolic activation Method: OECD Guideline 476 Result: negative Test Type: Sister Chromatid Exchange Assay Metabolic activation: with and without metabolic activation Method: OECD Guideline 479 Result: negative Test Type: Chromosome aberration test in vitro Metabolic activation: with and without metabolic activation Method: OECD Guideline 473 Result: Ambiguous
Decant (clarified) Oils		Test Type: Modified Ames test Result: positive

Test Type: Mouse lymphoma assay
Result: positive

Test Type: Sister Chromatid Exchange Assay
Result: positive

Test Type: Unscheduled DNA synthesis assay
Result: positive

Test Type: Cell transformation assay
Result: Ambiguous

Genotoxicity in vivo

Light Cycle Oil : Test Type: Cytogenetic assay
Result: negative

tert-Dodecanethiol Test Type: In vivo micronucleus test
Species: Mouse
Route of Application: Oral
Dose: 1250, 2500, 5000 mg/kg/bw
Method: Mutagenicity (micronucleus test)
Result: negative
Remarks: Information given is based on data obtained from similar substances.

Decant (clarified) Oils Test Type: Sister Chromatid Exchange Assay
Result: positive

Orfom® MC 37 Collector
Carcinogenicity : Method: Expected to be carcinogenic based on individual component data.

Reproductive toxicity

tert-Dodecanethiol : Species: Rat
Sex: male
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg/d
Exposure time: 35 d
Number of exposures: Daily
Method: OECD Guideline 422
NOAEL Parent: >= 250 mg/kg
Information given is based on data obtained from similar substances.

Species: Rat
Sex: female
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg/d
Exposure time: 53 d
Number of exposures: Daily
Method: OECD Guideline 422
NOAEL Parent: 50 mg/kg
NOAEL F1: 50 mg/kg
Information given is based on data obtained from similar substances.
Decrease in Delivery Index

Decant (clarified) Oils — Suspected of damaging fertility or the unborn child.

Developmental Toxicity

Light Cycle Oil : Species: Rat
Application Route: Dermal
Dose: 1, 50, 250 mg/kg/d
Number of exposures: once daily
Test period: GD 0-19
Method: OECD Guideline 414
NOAEL Teratogenicity: 1 mg/kg
NOAEL Maternal: 1 mg/kg

tert-Dodecanethiol — Species: Rat
Application Route: Inhalation
Dose: 0, 22.7, 88.6 ppm
Number of exposures: 6 hrs/d
Test period: GD 6-19
Method: OECD Guideline 414
NOAEL Teratogenicity: >= 88.6 ppm
No adverse effects expected

Species: Mouse
Application Route: Inhalation
Dose: 0, 22.7, 88.6 ppm
Number of exposures: 6 hrs/d
Test period: GD 6-19
Method: OECD Guideline 414
NOAEL Teratogenicity: >= 88.6 ppm
No adverse effects expected

Decant (clarified) Oils — Species: Rat
Application Route: Dermal
Dose: 0, 0.05, 1, 50, 250 mg/kg/bw/d
Exposure time: 6h/d
Number of exposures: daily
Test period: GD 0-19
NOAEL Teratogenicity: 0.05 mg/kg
NOAEL Maternal: 0.05 mg/kg
Suspected of damaging fertility or the unborn child.

Orfom® MC 37 Collector
Aspiration toxicity : May be fatal if swallowed and enters airways.

CMR effects

Light Cycle Oil	:	Carcinogenicity: Possible human carcinogen
tert-Dodecanethiol		Carcinogenicity: Not available Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Teratogenicity: Animal testing did not show any effects on fetal development. Reproductive toxicity: No toxicity to reproduction
Decant (clarified) Oils		Carcinogenicity: Possible human carcinogen Reproductive toxicity: Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

Orfom® MC 37 Collector
Further information : Solvents may degrease the skin.

SECTION 12: Ecological information

Toxicity to fish

Light Cycle Oil	:	LL50: > 0.3 mg/l Exposure time: 96 h Species: Oncorhynchus mykiss (rainbow trout) semi-static test Method: OECD Test Guideline 203
tert-Dodecanethiol		LL50: > 100 mg/l Exposure time: 96 h Species: Danio rerio (Zebra Fish) static test Method: OECD Test Guideline 203 No toxicity at the limit of solubility.
Decant (clarified) Oils		LL50: 79 mg/l Exposure time: 96 h semi-static test Method: OECD Test Guideline 203 Information given is based on data obtained from similar substances.

Toxicity to daphnia and other aquatic invertebrates

Light Cycle Oil	:	EL50: 0.32 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) Immobilization Method: OECD Test Guideline 202
tert-Dodecanethiol		EC50: > 0.056 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) semi-static test Method: OECD Test Guideline 202 No toxicity at the limit of solubility.
Decant (clarified) Oils		EL50: 0.22 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) static test Method: OECD Test Guideline 202

Toxicity to algae

Light Cycle Oil	:	EL50: 0.51 mg/l Exposure time: 72 h Species: Pseudokirchneriella subcapitata (green algae) Growth inhibition Method: OECD Test Guideline 201
Decant (clarified) Oils		EL50: 0.32 mg/l Exposure time: 72 h static test Method: OECD Test Guideline 201

M-Factor

Distillates (petroleum), light catalytic cracked	:	M-Factor (Acute Aquat. Tox.)	1
		M-Factor (Chron. Aquat. Tox.)	1

M-Factor

Clarified oils (petroleum), catalytic cracked	:	M-Factor (Acute Aquat. Tox.)	1
		M-Factor (Chron. Aquat. Tox.)	1

Toxicity to bacteria

tert-Dodecanethiol	:	NOEC: 8.6 mg/l Exposure time: 3 h Growth rate Respiration inhibition Method: OECD Test Guideline 209 NOEC: > 10 mg/l Exposure time: 3 h Growth rate Respiration inhibition Method: OECD Test Guideline 209

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

tert-Dodecanethiol	:	NOEC: 0.0108 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) semi-static test Method: OECD Test Guideline 211 No toxicity at the limit of solubility.
Biodegradability	:	Taking into consideration the properties of several ingredients, the product is estimated not to be readily biodegradable according to OECD classification.

Elimination information (persistence and degradability)

Bioaccumulation

tert-Dodecanethiol	:	Species: Danio rerio (zebra fish)

Exposure time: 15 d
Bioconcentration factor (BCF): > 500 - < 1,950
Method: OECD Test Guideline 305
Biomagnification factor <1
The product may be accumulated in organisms.

Results of PBT assessment

Light Cycle Oil	:	Non-classified PBT substance, Non-classified vPvB substance
tert-Dodecanethiol	:	Non-classified PBT substance, Non-classified vPvB substance
Decant (clarified) Oils	:	Non-classified PBT substance, Non-classified vPvB substance
Additional ecological information	:	Very toxic to aquatic life with long lasting effects.

Ecotoxicology Assessment

Short-term (acute) aquatic hazard

Light Cycle Oil	:	Very toxic to aquatic life.
tert-Dodecanethiol	:	No toxicity at the limit of solubility.
Decant (clarified) Oils	:	Very toxic to aquatic life.

Long-term (chronic) aquatic hazard

Light Cycle Oil	:	Very toxic to aquatic life with long lasting effects.
tert-Dodecanethiol	:	May cause long lasting harmful effects to aquatic life.
Decant (clarified) Oils	:	Very toxic to aquatic life with long lasting effects.

Toxicity Data on Soil

tert-Dodecanethiol	:	Adsorbs on soil.

SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product	:	The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)
UN1268, PETROLEUM DISTILLATES, N.O.S., COMBUSTIBLE LIQUID, III

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (LIGHT CYCLE OIL, DECANT (CLARIFIED) OILS), 9, III, (93°C), MARINE POLLUTANT, (LIGHT CYCLE OIL, DECANT (CLARIFIED) OILS)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN3334, AVIATION REGULATED LIQUID, N.O.S., (LIGHT CYCLE OIL, DECANT (CLARIFIED) OILS), 9, III

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (LIGHT CYCLE OIL, DECANT (CLARIFIED) OILS), 9, III

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (LIGHT CYCLE OIL, DECANT (CLARIFIED) OILS), 9, III

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (LIGHT CYCLE OIL, DECANT (CLARIFIED) OILS), 9, III

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

SECTION 15: Regulatory information

National legislation

SARA 311/312 Hazards : Fire Hazard
Acute Health Hazard
Chronic Health Hazard

EPCRA - EMERGENCY PLANNING COMMUNITY RIGHT - TO – KNOW

CERCLA Reportable Quantity	:	This material does not contain any components with a CERCLA RQ.
SARA 302 Reportable Quantity	:	This material does not contain any components with a SARA 302 RQ.
SARA 302 Threshold Planning Quantity	:	No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
SARA 304 Reportable Quantity	:	This material does not contain any components with a section 304 EHS RQ.
SARA 313 Components	:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

Ozone-Depletion Potential	:	This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

US State Regulations

Pennsylvania Right To Know	:	tert-Dodecanethiol - 25103-58-6
California Prop. 65 Components	:	WARNING! This product contains a chemical known in the State of California to cause cancer.

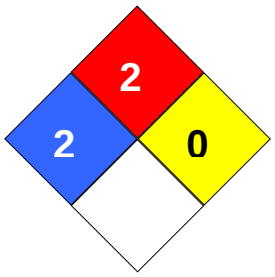
Decant (clarified) Oils		64741-62-4

Notification status

Europe REACH	:	A substance or substances in this product is not registered or notified to be registered. Importation or manufacture of this product is still permitted provided that it does not exceed the REACH minimum threshold quantity of the non-regulated substances.
Switzerland CH INV	:	On the inventory, or in compliance with the inventory
United States of America (USA) TSCA	:	On or in compliance with the active portion of the TSCA inventory
Canada DSL	:	All components of this product are on the Canadian DSL
Australia AICS	:	On the inventory, or in compliance with the inventory
New Zealand NZIoC	:	Not in compliance with the inventory
Japan ENCS	:	On the inventory, or in compliance with the inventory
Korea KECI	:	A substance(s) in this product was not registered, notified to be registered, or exempted from registration by CPChem according to K-REACH regulations. Importation or manufacture of this product is still permitted provided the Korean Importer of Record has themselves notified the substance.
Philippines PICCS	:	Not in compliance with the inventory
China IECSC	:	On the inventory, or in compliance with the inventory
Taiwan TCSI	:	On the inventory, or in compliance with the inventory

SECTION 16: Other information

NFPA Classification : Health Hazard: 2
Fire Hazard: 2
Reactivity Hazard: 0



Further information

Legacy SDS Number : CPC00568

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

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.

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

Orfom® CO 100 Collector

Version 4.7 Revision Date 2019-07-12

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product information

Product Name : Orfom® CO 100 Collector
Material : 1122542, 1122063, 1122062, 1122012, 1106613, 1096244, 1078402, 1090264, 1097072, 1016857

Company : Chevron Phillips Chemical Company LP
Mining Chemicals
10001 Six Pines Drive
The Woodlands, TX 77380

Emergency telephone:

Health:
866.442.9628 (North America)
1.832.813.4984 (International)
Transport:
CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Mexico CHEMTREC 01-800-681-9531 (24 hours)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600
Argentina: +(54)-1159839431

Responsible Department : Product Safety and Toxicology Group
E-mail address : SDS@CPChem.com
Website : www.CPChem.com

SECTION 2: Hazards identification

Classification of the substance or mixture
This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

Classification

: Skin corrosion, Category 1C
Serious eye damage, Category 1
Skin sensitization, Category 1

Labeling

Symbol(s) :

Signal Word : Danger

Hazard Statements : H314: Causes severe skin burns and eye damage.
H317: May cause an allergic skin reaction.

Precautionary Statements : **Prevention:**
P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
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 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P302 + P352 IF ON SKIN: Wash with plenty of water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.
Storage:
P405 Store locked up.
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Carcinogenicity:

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

SECTION 3: Composition/information on ingredients

Synonyms : Normal Dodecyl Mercaptan
1-dodecanethiol
NDDM
dodecanethiol

Molecular formula : C12H26S

Component	CAS-No.	Weight %
n-Dodecyl Mercaptan	112-55-0	98.5

SECTION 4: First aid measures

General advice	:	Move out of dangerous area. Consult a physician. Show this material safety data sheet to the doctor in attendance.
If inhaled	:	If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
In case of skin contact	:	Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty. If on skin, rinse well with water. If on clothes, remove clothes.
In case of eye contact	:	Small amounts splashed into eyes can cause irreversible tissue damage and blindness. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Continue rinsing eyes during transport to hospital. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	:	Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point	:	133 °C (271 °F)
Autoignition temperature	:	230 °C (446 °F)
Unsuitable extinguishing media	:	High volume water jet.
Specific hazards during fire fighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Special protective equipment for fire-fighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Fire and explosion protection	:	Normal measures for preventive fire protection.
Hazardous decomposition products	:	Carbon oxides. Sulfur oxides.

SECTION 6: Accidental release measures

Personal precautions	:	Use personal protective equipment. Ensure adequate

ventilation.

Environmental precautions : Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

Methods for cleaning up : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

SECTION 7: Handling and storage

Handling

Advice on safe handling : Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. To avoid spills during handling keep bottle on a metal tray. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

Storage

Requirements for storage areas and containers : Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8: Exposure controls/personal protection

Ingredients with workplace control parameters

US

Components	Basis	Value	Control parameters	Note
n-Dodecyl Mercaptan	ACGIH	TWA	0.1 ppm,	DSEN, URT irr,

DSEN Dermal Sensitization
URT irr Upper Respiratory Tract irritation

Engineering measures

Adequate ventilation to control airborned concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

Respiratory protection	:	Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as:. Air-Purifying Respirator for Dusts and Mists. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.
Hand protection	:	The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Eye protection	:	Eye wash bottle with pure water.
Skin and body protection	:	Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate:. Remove and wash contaminated clothing before re-use. Skin should be washed after contact. Complete head face and neck protection. Rubber apron. Footwear protecting against chemicals.
Hygiene measures	:	When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance

Physical state	:	Liquid
Color	:	Colorless
Odor	:	Repulsive

Safety data

Flash point	:	133 °C (271 °F)
Lower explosion limit	:	No data available
Upper explosion limit	:	No data available
Oxidizing properties	:	no
Autoignition temperature	:	230 °C (446 °F)
Molecular formula	:	C12H26S
Molecular weight	:	202.44 g/mol
pH	:	Not applicable

Pour point	:	No data available
Boiling point/boiling range	:	270 °C (518 °F)
Vapor pressure	:	0.00 mbar at 25 °C (77 °F)
Relative density	:	No data available
Water solubility	:	0.0054 mg/l Method: OECD Test Guideline 105
Partition coefficient: n-octanol/water	:	No data available
Viscosity, dynamic	:	2.98 cP at 25 °C (77 °F)
Relative vapor density	:	1 (Air = 1.0)
Evaporation rate	:	No data available

SECTION 10: Stability and reactivity

Reactivity	:	Stable under recommended storage conditions.
Chemical stability	:	This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

Hazardous reactions	:	Hazardous reactions: Hazardous polymerization does not occur. Further information: No decomposition if stored and applied as directed.
Conditions to avoid	:	Heat, sparks, fire, and oxidizing agents.
Materials to avoid	:	May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous decomposition products	:	Carbon oxides Sulfur oxides
Other data	:	No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

Acute oral toxicity

n-Dodecyl Mercaptan : LD50: > 5,000 mg/kg
Species: Rat
Sex: male

Acute inhalation toxicity

n-Dodecyl Mercaptan : : > 3.10 mg/l
Exposure time: 4.5 h
Species: Rat
Sex: male and female
Test atmosphere: vapor
Method: OECD Test Guideline 403
Information given is based on data obtained from similar substances.

Skin irritation

n-Dodecyl Mercaptan : Corrosive after 1 to 4 hours of exposure

Eye irritation

n-Dodecyl Mercaptan : Irreversible effects on the eye

Sensitization

n-Dodecyl Mercaptan : The product is a skin sensitizer, sub-category 1A.

Repeated dose toxicity

n-Dodecyl Mercaptan : Species: Rat
Application Route: Inhalation
Dose: 0, 0.43, 1.6, 7.3 ppm
Exposure time: 4 wk
NOEL: 0.01 mg/l 1.7 ppm
Lowest observable effect level: 0.06 mg/l 7.3 ppm
Target Organs: Skin

Species: Dog
Application Route: Inhalation
Dose: 0, 0.44, 1.7, 7.7 ppm
Exposure time: 4 wk
NOEL: 1.7 ppm
Lowest observable effect level: 7.7 ppm

Genotoxicity in vitro

n-Dodecyl Mercaptan : Test Type: Ames test
Result: negative

Test Type: Sister Chromatid Exchange Assay
Result: negative

Test Type: Mouse lymphoma assay
Result: negative

Genotoxicity in vivo

n-Dodecyl Mercaptan : Test Type: Mouse micronucleus assay
Species: Mouse
Dose: 1250, 2500, 5000 mg/kg

Orfom® CO 100 Collector
Aspiration toxicity : May be harmful if swallowed and enters airways.

CMR effects

n-Dodecyl Mercaptan : Carcinogenicity: Not available
Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Teratogenicity: Animal testing did not show any effects on fetal development.
Reproductive toxicity: Animal testing did not show any effects on fertility.

Orfom® CO 100 Collector
Further information : Solvents may degrease the skin.

SECTION 12: Ecological information

Toxicity to fish

n-Dodecyl Mercaptan : LC50: > 100 mg/l
Exposure time: 96 h
Species: Oncorhynchus mykiss (rainbow trout)

Toxicity to daphnia and other aquatic invertebrates

n-Dodecyl Mercaptan : EC50: 1 - 10 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 202

Toxicity to algae

n-Dodecyl Mercaptan : EC50: 0.0145 mg/l
Exposure time: 72 h
Species: Pseudokirchneriella subcapitata (green algae)
Growth inhibition Method: OECD Test Guideline 201

Biodegradability

n-Dodecyl Mercaptan	:	Result: Not readily biodegradable. Method: OECD Test Guideline 301 Information given is based on data obtained from similar substances.

Bioaccumulation

n-Dodecyl Mercaptan	:	Bioconcentration factor (BCF): 234 Method: Estimated based on individual component values.
Additional ecological information	:	Very toxic to aquatic life with long lasting effects.

Ecotoxicology Assessment

Short-term (acute) aquatic hazard
n-Dodecyl Mercaptan : Very toxic to aquatic life.

Long-term (chronic) aquatic hazard
n-Dodecyl Mercaptan : Very toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product	:	The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)
UN1760, CORROSIVE LIQUIDS, N.O.S., (N-DODECYL MERCAPTAN), 8, III

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN1760, CORROSIVE LIQUID, N.O.S., (N-DODECYL MERCAPTAN), 8, III, (133 °C), MARINE POLLUTANT, (N-DODECYL MERCAPTAN)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN1760, CORROSIVE LIQUID, N.O.S., (N-DODECYL MERCAPTAN), 8, III

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN1760, CORROSIVE LIQUID, N.O.S., (N-DODECYL MERCAPTAN), 8, III, (E), ENVIRONMENTALLY HAZARDOUS, (N-DODECYL MERCAPTAN)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN1760, CORROSIVE LIQUID, N.O.S., (N-DODECYL MERCAPTAN), 8, III, ENVIRONMENTALLY HAZARDOUS, (N-DODECYL MERCAPTAN)

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN1760, CORROSIVE LIQUID, N.O.S., (N-DODECYL MERCAPTAN), 8, III, ENVIRONMENTALLY HAZARDOUS, (N-DODECYL MERCAPTAN)

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

Other information	**:**	**n- Dodecyl Mercaptan, S.T. 1, Cat. X**

SECTION 15: Regulatory information

National legislation

SARA 311/312 Hazards	:	Skin corrosion or irritation Serious eye damage or eye irritation Respiratory or skin sensitization
CERCLA Reportable Quantity	:	This material does not contain any components with a CERCLA RQ.
SARA 302 Reportable Quantity	:	This material does not contain any components with a SARA 302 RQ.
SARA 302 Threshold Planning Quantity	:	This material does not contain any components with a section 302 EHS TPQ.
SARA 304 Reportable Quantity	:	This material does not contain any components with a section 304 EHS RQ.

SARA 313 Components : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

Ozone-Depletion Potential : This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

US State Regulations

Pennsylvania Right To Know : n-Dodecyl Mercaptan - 112-55-0

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

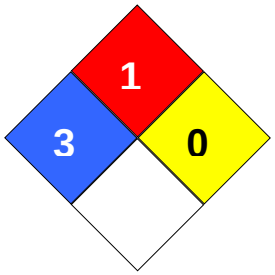
Notification status

Europe REACH	:	On the inventory, or in compliance with the inventory
United States of America (USA) TSCA	:	On TSCA Inventory
Canada DSL	:	All components of this product are on the Canadian DSL
Australia AICS	:	On the inventory, or in compliance with the inventory
New Zealand NZIoC	:	On the inventory, or in compliance with the inventory
Japan ENCS	:	On the inventory, or in compliance with the inventory
Korea KECI	:	On the inventory, or in compliance with the inventory

Philippines PICCS	:	On the inventory, or in compliance with the inventory
China IECSC	:	On the inventory, or in compliance with the inventory

SECTION 16: Other information

NFPA Classification : Health Hazard: 3
Fire Hazard: 1
Reactivity Hazard: 0



Further information

Legacy SDS Number : 98010

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

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.

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value

IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

Orfom® MC9747 Collector

Version 1.0 Revision Date 2018-07-11

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product information

Product Name : Orfom® MC9747 Collector

Company : Chevron Phillips Chemical Company LP
10001 Six Pines Drive
The Woodlands, TX 77380

Emergency telephone:

Health:
866.442.9628 (North America)
1.832.813.4984 (International)
Transport:
CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Mexico CHEMTREC 01-800-681-9531 (24 hours)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600
Argentina: +(54)-1159839431

Responsible Department : Product Safety and Toxicology Group
E-mail address : SDS@CPChem.com
Website : www.CPChem.com

SECTION 2: Hazards identification

Classification of the substance or mixture
This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

Classification

: Flammable liquids, Category 3
Acute toxicity, Category 4, Oral
Skin irritation, Category 2
Eye irritation, Category 2A
Skin sensitization, Category 1
Specific target organ systemic toxicity - single exposure, Category 3, Respiratory system

Labeling

Symbol(s) :

Signal Word : Warning

Hazard Statements : H226: Flammable liquid and vapor.
H302: Harmful if swallowed.
H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H335: May cause respiratory irritation.

Precautionary Statements : **Prevention:**
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing must not be allowed out of the workplace.
P280 Wear protective gloves/ eye protection/ face protection.
Response:
P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
Storage:
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Carcinogenicity:

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

SECTION 3: Composition/information on ingredients

Component	CAS-No.	Weight %
tert-Dodecanethiol	25103-58-6	10 - 50
Methyl Isobutyl Carbinol	108-11-2	10 - 50
Isopropyl xanthogen ethyl formate	67969-80-6	10 - 50
Allyl amyl xanthate ester	2956-12-9	10 - 50

SECTION 4: First aid measures

General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.

If inhaled : If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.

In case of skin contact : If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact : Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point : 42 °C (108 °F)

Autoignition temperature : No data available

Suitable extinguishing media : Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical.

Unsuitable extinguishing media : High volume water jet.

Specific hazards during fire fighting : Do not allow run-off from fire fighting to enter drains or water courses.

Special protective equipment for fire-fighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.
Fire and explosion protection	:	Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Keep away from open flames, hot surfaces and sources of ignition.

SECTION 6: Accidental release measures

Personal precautions	:	Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods for cleaning up	:	Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

SECTION 7: Handling and storage

Handling

Advice on safe handling	:	Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
Advice on protection against fire and explosion	:	Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Keep away from open flames, hot surfaces and sources of ignition.

Storage

Requirements for storage areas and containers : No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8: Exposure controls/personal protection

Ingredients with workplace control parameters

Chevron Phillips Chemical Company LP

Ingredients	Basis	Value	Control parameters	Note
tert-Dodecanethiol	Manufacturer	TWA	0.1 ppm,	

US

Ingredients	Basis	Value	Control parameters	Note
Methyl Isobutyl Carbinol	ACGIH	TWA	25 ppm,	CNS impair, URT irr, eye irr, Skin,
	ACGIH	STEL	40 ppm,	CNS impair, URT irr, eye irr, Skin,
	OSHA Z-1	TWA	25 ppm, 100 mg/m3	X, (b),
	OSHA Z-1-A	TWA	25 ppm, 100 mg/m3	X,
	OSHA Z-1-A	STEL	40 ppm, 165 mg/m3	X,

(b) The value in mg/m3 is approximate.
CNS impair Central Nervous System impairment
eye irr Eye irritation
Skin Danger of cutaneous absorption
URT irr Upper Respiratory Tract irritation
X Skin notation

Immediately Dangerous to Life or Health Concentrations (IDLH)

Substance name	CAS-No.	Control parameters	Update
Methyl Isobutyl Carbinol	108-11-2	Immediately Dangerous to Life or Health Concentration Value 400 parts per million	1995-03-01

Engineering measures

Adequate ventilation to control airborned concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

Respiratory protection : Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as:. Air-Purifying Respirator for Organic Vapors. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Hand protection	:	The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Eye protection	:	Eye wash bottle with pure water. Tightly fitting safety goggles.
Skin and body protection	:	Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate:. Flame retardant antistatic protective clothing. Footwear protecting against chemicals.
Hygiene measures	:	When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance

Form	:	Liquid
Physical state	:	Liquid
Color	:	Colorless to light yellow
Odor	:	garlic-like
Odor Threshold	:	No data available

Safety data

Flash point	:	42 °C (108 °F)
Lower explosion limit	:	No data available
Upper explosion limit	:	No data available
Autoignition temperature	:	No data available
Thermal decomposition	:	200 °C
Molecular weight	:	Not applicable
pH	:	Not applicable
Melting point/range	:	-90 °C (-130 °F)
Freezing point		-90 °C (-130 °F)
Boiling point/boiling range	:	132 °C (270 °F)
Vapor pressure	:	No data available

Relative density	:	0.95 - 0.99
Density	:	0.95 - 0.99 G/ML
Water solubility	:	Negligible
Partition coefficient: n-octanol/water	:	No data available
Viscosity, kinematic	:	No data available
Relative vapor density	:	No data available
Evaporation rate	:	No data available

SECTION 10: Stability and reactivity

Chemical stability : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

Conditions to avoid : Heat, flames and sparks.

Thermal decomposition : 200 °C

Other data : No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

Orfom® MC9747 Collector
Acute oral toxicity : LD50 Oral: 529.67 mg/kg
Species: Rat
Method: Acute toxicity estimate

Orfom® MC9747 Collector
Acute inhalation toxicity : No data available

Orfom® MC9747 Collector
Acute dermal toxicity : LD50 Dermal: > 5,000 mg/kg
Species: Rabbit
Method: Acute toxicity estimate

Orfom® MC9747 Collector
Skin irritation : May irritate skin.

Orfom® MC9747 Collector
Eye irritation : May irritate eyes.

Orfom® MC9747 Collector
Sensitization : May cause sensitization of susceptible persons. Estimated based on individual component values.

Repeated dose toxicity

tert-Dodecanethiol : Species: Rat, male
Sex: male
Application Route: Inhalation
Dose: 0, 26, 98 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
Lowest observable effect level: 26 ppm
Method: OECD Test Guideline 412
Target Organs: Kidney, Liver

Species: Rat, female
Sex: female
Application Route: Inhalation
Dose: 0, 26, 98 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
NOEL: 26 ppm
Method: OECD Guideline 412
Target Organs: Liver, Kidney

Species: Dog, male and female
Sex: male and female
Application Route: Inhalation
Dose: 0, 25, 106 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
NOEL: 25 ppm
Lowest observable effect level: 109 ppm
Method: OECD Test Guideline 412
Target Organs: Liver

Species: Mouse, male and female
Sex: male and female
Application Route: Inhalation
Dose: 0, 25, 109 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
Lowest observable effect level: 25 ppm
Method: OECD Test Guideline 412
Target Organs: Liver

Species: Rat, male
Sex: male
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg
Exposure time: 35 d
Number of exposures: once daily
NOEL: 50 mg/kg
Method: OECD Guideline 422
Target Organs: Liver, spleen
Information given is based on data obtained from similar substances.

Species: Rat, female
Sex: female
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg
Exposure time: 53 d
Number of exposures: once daily
NOEL: 50 mg/kg
Method: OECD Guideline 422
Target Organs: Liver, spleen
Information given is based on data obtained from similar substances.

Species: Rat, male
Sex: male
Application Route: Inhalation
Dose: 5, 25, 100 ppm
Exposure time: 90 d

	Number of exposures: 6h/d, 5d/wk NOEL: 25 ppm Method: OECD Test Guideline 413 Species: Rat, female Sex: female Application Route: Inhalation Dose: 5, 25, 100 ppm Exposure time: 90 d Number of exposures: 6h/d, 5d/wk NOEL: 25 ppm Method: OECD Test Guideline 413
Isopropyl xanthogen ethyl formate	Species: Rat, male and female Sex: male and female Application Route: oral gavage Dose: 10, 50. 250 mg/kg Exposure time: 28 d Number of exposures: 7d/wk NOEL: 10 mg/kg Target Organs: Blood Information given is based on data obtained from similar substances.
Allyl amyl xanthate ester	Species: Rat, male and female Sex: male and female Application Route: oral gavage Dose: 10, 50, 250 mg/kg Exposure time: 28 d Number of exposures: 7d/wk NOEL: 10 mg/kg Target Organs: Blood Information given is based on data obtained from similar substances.

Reproductive toxicity

tert-Dodecanethiol	:	Species: Rat Sex: male Application Route: oral gavage Dose: 10, 50, 250 mg/kg/d Exposure time: 35 d Number of exposures: Daily Method: OECD Guideline 422 NOAEL Parent: >= 250 mg/kg Information given is based on data obtained from similar substances.

Species: Rat
Sex: female
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg/d
Exposure time: 53 d
Number of exposures: Daily
Method: OECD Guideline 422
NOAEL Parent: 50 mg/kg
NOAEL F1: 50 mg/kg
Information given is based on data obtained from similar substances.
Decrease in Delivery Index

Developmental Toxicity

tert-Dodecanethiol : Species: Rat
Application Route: Inhalation
Dose: 0, 22.7, 88.6 ppm
Number of exposures: 6 hrs/d
Test period: GD 6-19
Method: OECD Guideline 414
NOAEL Teratogenicity: >= 88.6 ppm
No adverse effects expected

Species: Mouse
Application Route: Inhalation
Dose: 0, 22.7, 88.6 ppm
Number of exposures: 6 hrs/d
Test period: GD 6-19
Method: OECD Guideline 414
NOAEL Teratogenicity: >= 88.6 ppm
No adverse effects expected

Aspiration toxicity

tert-Dodecanethiol : May be harmful if swallowed and enters airways.

CMR effects

tert-Dodecanethiol : Carcinogenicity: Not available
Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Teratogenicity: Animal testing did not show any effects on fetal development.
Reproductive toxicity: No toxicity to reproduction

Orfom® MC9747 Collector
Further information : Solvents may degrease the skin.

SECTION 12: Ecological information

Toxicity to fish

tert-Dodecanethiol : LL50: > 100 mg/l
Exposure time: 96 h
Species: Danio rerio (Zebra Fish)
static test Method: OECD Test Guideline 203

No toxicity at the limit of solubility.

Methyl Isobutyl Carbinol	> 92.4 mg/l Exposure time: 96 h Species: Pimephales promelas (fathead minnow) semi-static test Method: OECD Test Guideline 203
Isopropyl xanthogen ethyl formate	LC50: 48.3 mg/l Exposure time: 96 h Species: Fish Method: QSAR modeled data
Allyl amyl xanthate ester	LC50: 4.57 mg/l Exposure time: 96 h Species: Fish Method: QSAR modeled data

Toxicity to daphnia and other aquatic invertebrates

tert-Dodecanethiol	:	EC50: > 0.056 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) semi-static test Method: OECD Test Guideline 202 No toxicity at the limit of solubility.
Methyl Isobutyl Carbinol		EC50: 337 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) semi-static test Method: OECD Test Guideline 202
Isopropyl xanthogen ethyl formate		EC50: 86.4 mg/l Exposure time: 48 h Species: Daphnia Method: QSAR
Allyl amyl xanthate ester		EC50: 8.24 mg/l Exposure time: 48 h Species: Daphnia Method: QSAR modeled data

Toxicity to algae

Methyl Isobutyl Carbinol	:	334 mg/l Exposure time: 96 h Species: Pseudokirchneriella subcapitata (algae) Growth inhibition Method: OECD Test Guideline 201
Isopropyl xanthogen ethyl formate		38.4 mg/l Exposure time: 96 h Species: green algae Method: QSAR modeled data
Allyl amyl xanthate ester		EC50: 2.84 mg/l Exposure time: 96 h Species: green algae Method: QSAR modeled data

Toxicity to bacteria

tert-Dodecanethiol	:	NOEC: 8.6 mg/l Exposure time: 3 h Growth rate Respiration inhibition Method: OECD Test Guideline 209 NOEC: > 10 mg/l Exposure time: 3 h Growth rate Respiration inhibition Method: OECD Test Guideline 209

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

tert-Dodecanethiol	:	NOEC: 0.0108 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) semi-static test Method: OECD Test Guideline 211 No toxicity at the limit of solubility.

Bioaccumulation

tert-Dodecanethiol	:	Species: Danio rerio (zebra fish) Exposure time: 15 d Bioconcentration factor (BCF): > 500 - < 1,950 Method: OECD Test Guideline 305 Biomagnification factor <1 The product may be accumulated in organisms.

Biodegradability

tert-Dodecanethiol	:	Result: Not readily biodegradable. 0 % Testing period: 28 d Method: OECD Test Guideline 301D
Methyl Isobutyl Carbinol	:	aerobic 85 % Testing period: 28 d Method: OECD Test Guideline 301F
Isopropyl xanthogen ethyl formate	:	This material is expected to be readily biodegradable. Information given is based on data obtained from similar substances.
Allyl amyl xanthate ester	:	anaerobic Result: Readily biodegradable. 73.74 % Method: OECD Test Guideline 301A

Ecotoxicology Assessment

Acute aquatic toxicity	:	Toxic to aquatic life.

Chronic aquatic toxicity	:	Harmful to aquatic life with long lasting effects.
Toxicity Data on Soil tert-Dodecanethiol	:	Adsorbs on soil.
Results of PBT assessment tert-Dodecanethiol	:	Non-classified PBT substance, Non-classified vPvB substance
Additional ecological information	:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Toxic to aquatic life., May cause long lasting harmful effects to aquatic life.

SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product	:	The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)
UN1993, FLAMMABLE LIQUIDS, N.O.S., (METHYL ISOBUTYL CARBINOL), 3, III

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN1993, FLAMMABLE LIQUID, N.O.S., (METHYL ISOBUTYL CARBINOL), 3, III, (42 °C)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN1993, FLAMMABLE LIQUID, N.O.S., (METHYL ISOBUTYL CARBINOL), 3, III

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN1993, FLAMMABLE LIQUID, N.O.S., (METHYL ISOBUTYL CARBINOL), 3, III, (D/E)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN1993, FLAMMABLE LIQUID, N.O.S., (METHYL ISOBUTYL CARBINOL), 3, III

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN1993, FLAMMABLE LIQUID, N.O.S., (METHYL ISOBUTYL CARBINOL), 3, III

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

SECTION 15: Regulatory information

National legislation

SARA 311/312 Hazards	:	Flammable (gases, aerosols, liquids, or solids) Acute toxicity (any route of exposure) Skin corrosion or irritation Serious eye damage or eye irritation Respiratory or skin sensitization Specific target organ toxicity (single or repeated exposure)
CERCLA Reportable Quantity	:	This material does not contain any components with a CERCLA RQ.
SARA 302 Reportable Quantity	:	This material does not contain any components with a SARA 302 RQ.
SARA 302 Threshold Planning Quantity	:	This material does not contain any components with a section 302 EHS TPQ.
SARA 304 Reportable Quantity	:	This material does not contain any components with a section 304 EHS RQ.
SARA 313 Ingredients	:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

Ozone-Depletion Potential : This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489):
: Methyl Isobutyl Carbinol - 108-11-2

US State Regulations

Pennsylvania Right To Know
: tert-Dodecanethiol - 25103-58-6
Methyl Isobutyl Carbinol - 108-11-2

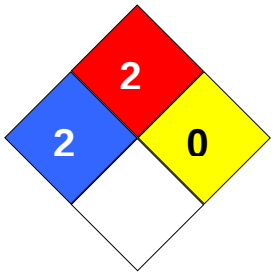
California Prop. 65 Ingredients : This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

Notification status

Europe REACH	:	Not in compliance with the inventory
Switzerland CH INV	:	Not in compliance with the inventory
United States of America (USA) TSCA	:	On TSCA Inventory
Canada NDSL	:	This product contains one or several components listed in the Canadian NDSL.
Australia AICS	:	Not in compliance with the inventory
New Zealand NZIoC	:	Not in compliance with the inventory
Japan ENCS	:	Not in compliance with the inventory
Korea KECI	:	Not in compliance with the inventory
Philippines PICCS	:	Not in compliance with the inventory
China IECSC	:	Not in compliance with the inventory

SECTION 16: Other information

NFPA Classification : Health Hazard: 2
Fire Hazard: 2
Reactivity Hazard: 0



Further information

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

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.

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and

			Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

POLYFROTH® H57

Version	Revision Date:	SDS Number:	Date of last issue: 07/31/2020
3.0	08/03/2020	400041003668	Date of first issue: 03/31/2020

Print Date 08/30/2021

SECTION 1. IDENTIFICATION

Product name : POLYFROTH® H57

Manufacturer or supplier's details

Company name of supplier : Indorama Ventures Oxides LLC
Address : 24 Waterway Ave., Suite 1100
The Woodlands,
Texas 77380
United States of America (USA)
Telephone : (256) 3405200

Manufacturer or supplier's details

E-mail address of person responsible for the SDS : SDSHUN@indorama.net

Emergency telephone number : CHEMTREC - USA (English)
Local Number (National): +1 703-741-5970
Toll-Free Number: 1-800-424-9300

Recommended use of the chemical and restrictions on use

Recommended use : Foaming agent

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity (Oral) : Category 4

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : H302 Harmful if swallowed.

Precautionary statements : **Prevention:**
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
Response:
P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
Storage:
Not available
Disposal:
P501 Dispose of contents/container to an approved facility in

accordance with local, regional, national and international regulations.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
Poly[oxy(methyl-1,2-ethanediyl)], .alpha.-butyl-.omega.-hydroxy-	9003-13-8	90 - 100
Propane-1,2-diol, propoxylated	ACCN # 124051	10 - 20

The specific chemical identity and/or exact percentage (concentration) of composition may be withheld as a trade secret.

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
Treat symptomatically.
Get medical attention if symptoms occur.

If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.

In case of skin contact : Wash with water and soap as a precaution.

In case of eye contact : Flush eyes with water as a precaution.
Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Induce vomiting immediately and call a physician.
Keep respiratory tract clear.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.

Most important symptoms and effects, both acute and delayed : None known.

Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing
If potential for exposure exists refer to Section 8 for specific personal protective equipment.
No action shall be taken involving any personal risk or without suitable training.

Notes to physician	:	Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Water spray Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	Exercise caution when using a high volume water jet as it may scatter and spread fire
Specific hazards during firefighting	:	No information available.
Hazardous combustion products	:	Carbon oxides
Specific extinguishing methods	:	No data is available on the product itself.
Further information	:	No action shall be taken involving any personal risk or without suitable training.
Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Refer to protective measures listed in sections 7 and 8.
Environmental precautions	:	Do not flush into surface water or sanitary sewer system. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	Do not breathe vapours/dust.

For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Dispose of rinse water in accordance with local and national regulations.

Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.
Keep in properly labelled containers.

Materials to avoid : For incompatible materials please refer to Section 10 of this SDS.

Further information on storage stability : Stable under normal conditions.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Propane-1,2-diol, propoxylated	25322-69-4	TWA (aerosol)	10 mg/m3	US WEEL

Personal protective equipment

Respiratory protection : No personal respiratory protective equipment normally required.

Hand protection

Remarks : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection : Eye wash bottle with pure water
Tightly fitting safety goggles

Skin and body protection : Impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures : When using do not eat or drink.
When using do not smoke.
Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

Colour	:	Clear
Odour	:	alcohol-like
Odour Threshold	:	No data is available on the product itself.
pH	:	6 - 8 Concentration: 100 g/l
Freezing point	:	-4 °F / -20 °C
Boiling point	:	> 392 °F / > 200 °C
Flash point	:	214 °F / 101 °C Method: closed cup
Evaporation rate	:	No data is available on the product itself.
Flammability (solid, gas)	:	No data is available on the product itself.
Flammability (liquids)	:	No data is available on the product itself.
Upper explosion limit / Upper flammability limit	:	No data is available on the product itself.
Lower explosion limit / Lower flammability limit	:	No data is available on the product itself.
Vapour pressure	:	No data is available on the product itself.
Relative vapour density	:	No data is available on the product itself.
Relative density	:	0.94
Density	:	No data is available on the product itself.
Solubility(ies)		
Water solubility	:	soluble
Solubility in other solvents	:	No data is available on the product itself.
Partition coefficient: n-octanol/water	:	No data is available on the product itself.
Auto-ignition temperature	:	No data is available on the product itself.
Thermal decomposition	:	No data is available on the product itself.
Self-Accelerating decomposition temperature (SADT)	:	No data is available on the product itself.
Viscosity		
Viscosity, dynamic	:	25 mPa.s (77 °F / 25 °C)

Explosive properties	:	No data is available on the product itself.
Oxidizing properties	:	No data is available on the product itself.
Particle size	:	No data is available on the product itself.

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	:	No hazards to be specially mentioned.
Conditions to avoid	:	None known.
Incompatible materials	:	None known.
Hazardous decomposition products	:	No hazardous decomposition products are known.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : No data is available on the product itself.

Acute toxicity

Acute oral toxicity - Product : LD50 (Rat): 1,840 mg/kg

Acute inhalation toxicity : No data available

Acute dermal toxicity : No data available

Acute toxicity (other routes of administration) : No data available

Skin corrosion/irritation

Components:

Propane-1,2-diol, propoxylated:
Species: Rabbit
Assessment: No skin irritation
Result: slight irritation

Serious eye damage/eye irritation

Components:

Propane-1,2-diol, propoxylated:
Species: Rabbit
Result: slight irritation
Assessment: No eye irritation

Respiratory or skin sensitisation

Components:

Propane-1,2-diol, propoxylated:
Exposure routes: Skin
Species: Humans
Result: Does not cause skin sensitisation.

Assessment: No data available

Germ cell mutagenicity

Components:

Propane-1,2-diol, propoxylated:

Genotoxicity in vitro	:	Metabolic activation: yes Result: negative
Genotoxicity in vivo	:	No data available
Germ cell mutagenicity-Assessment	:	No data available

Carcinogenicity

No data available

Carcinogenicity - Assessment	:	No data available

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Effects on fertility	:	No data available
Effects on foetal development	:	No data available
Reproductive toxicity - Assessment	:	No data available

STOT - single exposure

No data available

STOT - repeated exposure

No data available

Repeated dose toxicity

Components:

Propane-1,2-diol, propoxylated:
Species: Rat
NOEL: 3 %
Application Route: Ingestion
Exposure time: 2,400 h
Method: Subchronic toxicity

Species: Rat
NOAEL: 1000 mg/kg/d
Application Route: Skin contact
Exposure time: 2,160 h
Method: Subchronic toxicity

Repeated dose toxicity - Assessment : No data available

Aspiration toxicity

No data available

Experience with human exposure

General Information: No data available

Inhalation: No data available

Skin contact: No data available

Eye contact: No data available

Ingestion: No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

Ingestion: No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Toxicity to fish - Product	:	LC50: 564 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates - Product	:	EC50: > 1,000 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	No data available
M-Factor (Acute aquatic toxicity)	:	No data available
Toxicity to fish (Chronic toxicity)	:	No data available
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	No data available
M-Factor (Chronic aquatic toxicity)	:	No data available

Components:

Propane-1,2-diol, propoxylated:

Toxicity to microorganisms	:	EC10: > 10,000 mg/l
	:	IC0: 5,000 mg/l Method: Other guidelines
Toxicity to soil dwelling organisms	:	No data available
Plant toxicity	:	No data available
Sediment toxicity	:	No data available
Toxicity to terrestrial organisms	:	No data available

Ecotoxicology Assessment

Acute aquatic toxicity	:	No data available
Chronic aquatic toxicity	:	No data available
Toxicity Data on Soil	:	No data available
Other organisms relevant to the environment	:	No data available

Persistence and degradability

Biodegradability - Product	:	Result: Not readily biodegradable. Biodegradation: < 70 % Exposure time: 28 d Method: ISO Method, other
Biochemical Oxygen Demand (BOD)	:	No data available
Chemical Oxygen Demand (COD)	:	No data available
BOD/COD	:	No data available
ThOD	:	No data available
BOD/ThOD	:	No data available
Dissolved organic carbon (DOC)	:	No data available
Physico-chemical removability	:	No data available
Stability in water	:	No data available
Photodegradation	:	No data available
Impact on Sewage Treatment	:	No data available

Bioaccumulative potential

Bioaccumulation	:	No data available
Partition coefficient: n-octanol/water	:	No data available

Mobility in soil

Mobility	:	No data available
Distribution among environmental compartments	:	No data available
Stability in soil	:	No data available

Other adverse effects

Environmental fate and pathways	:	No data available
Results of PBT and vPvB assessment	:	No data available

Endocrine disrupting potential	:	No data available
Adsorbed organic bound halogens (AOX)	:	No data available

Hazardous to the ozone layer

Ozone-Depletion Potential	:	Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
Additional ecological information	:	No data available
Global warming potential (GWP)	:	No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company. Dispose of as hazardous waste in compliance with local and national regulations. Dispose of contents/ container to an approved waste disposal plant.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA
Not regulated as dangerous goods

IMDG
Not regulated as dangerous goods

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

National Regulations

DOT Classification
Not regulated as dangerous goods

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
methyloxirane	75-56-9	100	*

*: Calculated RQ exceeds reasonably attainable upper limit.

SARA 311/312 Hazards : Acute toxicity (any route of exposure)

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

California Prop. 65

WARNING: This product can expose you to chemicals including methyloxirane, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

The components of this product are reported in the following inventories:

DSL : All components of this product are on the Canadian DSL

AICS : On the inventory, or in compliance with the inventory

NZIoC : On the inventory, or in compliance with the inventory

ENCS : Not in compliance with the inventory

KECI : On the inventory, or in compliance with the inventory

PICCS : On the inventory, or in compliance with the inventory

IECSC : On the inventory, or in compliance with the inventory

TCSI : On the inventory, or in compliance with the inventory

TSCA : All substances listed as active on the TSCA inventory

Inventories

AICS (Australia), AIIC (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

TSCA - 5(a) Significant New Use Rule List of Chemicals

No substances are subject to a Significant New Use Rule.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)
No substances are subject to TSCA 12(b) export notification requirements.

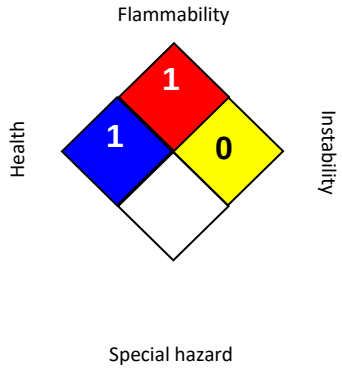
TSCA - 5(a) Significant New Use Rule List of Chemicals
No substances are subject to a Significant New Use Rule.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)
No substances are subject to TSCA 12(b) export notification requirements.

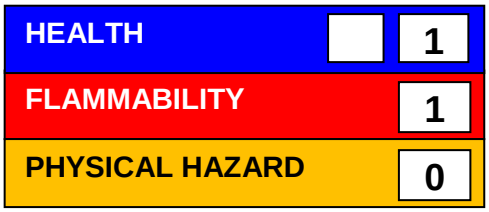
SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:



HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard

Revision Date : 08/03/2020

US WEEL : USA. Workplace Environmental Exposure Levels (WEEL)
US WEEL / TWA : 8-hr TWA

The information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

Material Safety Data Sheet

Quadra

Polyfroth® W31

WHMIS	Protective Clothing	TDG
		

1 . Product and company identification

Product name : Polyfroth® W31

Supplier : QUADRA CHEMICALS LTD.
3901 F.X. Tessier
Vaudreuil-Dorion, Quebec
Canada J7V 5V5
Tel: 1-800-665-6553

Material uses : Mining industry

Code : Q05348

Additional Code : M01856

Validation date : 4/20/2016.

Responsible name : Regulatory Affairs / Affaires réglementaires

In case of emergency : **TRANSPORTATION EMERGENCY - 24HRS/DAY - 7 DAYS/WEEK**
IN CANADA - CALL 1-800-567-7455

2 . Hazards identification

Physical state : Liquid. [Clear.]

Odor : Mild.

Emergency overview :

NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

No known significant effects or critical hazards. Avoid prolonged contact with eyes, skin and clothing.

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Inhalation : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Skin : No known significant effects or critical hazards.

Eyes : No known significant effects or critical hazards.

Potential chronic health effects

Chronic effects : No known significant effects or critical hazards.

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.

Target organs : Vapours or mist inhalation emitted by the heated polypropylene glycol can cause a stimulation of the central nervous system.

Over-exposure signs/symptoms

Inhalation : No specific data.

Ingestion : No specific data.

Skin : No specific data.

2 . Hazards identification

Eyes : No specific data.

Medical conditions aggravated by over-exposure : None known.

See toxicological information (section 11)

3 . Composition/information on ingredients

Name	CAS number	%
polypropylene glycol	25322-69-4	10 - 30

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.

4 . First aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention if symptoms occur.

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 clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms occur.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Flash point : Closed cup: 105°C (221°F)

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : 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.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

Personal precautions : 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 (see section 8).

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).

6 . Accidental release measures

Methods for cleaning up

Spill or leak : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking.

Storage : 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 and food and drink. Keep container tightly closed and sealed until ready for use. 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.

8 . Exposure controls/personal protection

Product name **Exposure limits**

No exposure limit value known.

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. Recommended: safety glasses with side-shields

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Recommended: lab coat

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

Physical state	: Liquid. [Clear.]
Flash point	: Closed cup: 105°C (221°F)
Color	: Amber.
Odor	: Mild.
pH	: 6 to 8
Boiling/condensation point	: 190°C (374°F)
Melting/freezing point	: -40°C (-40°F)
Relative density	: 0.98
Viscosity	: Kinematic: 0.22 cm^2/s (22 cSt) @ 25°C
Solubility	: Easily soluble in the following materials: cold water.

10 . Stability and reactivity

Stability	: The product is stable.
Hazardous polymerization	: Under normal conditions of storage and use, hazardous polymerization will not occur.
Conditions to avoid	: No specific data.
Materials to avoid	: oxidizing materials
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
polypropylene glycol	LD50 Oral	Rat	>2 g/kg	-

Conclusion/Summary : Not available.

12 . Ecological information

Environmental effects : Not available.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. 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. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Waste and empty packaging must be disposed of in accordance with federal, provincial, and municipal environmental control regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
TDG Classification	Not regulated.	-	-	-		-

14 . Transport information

PG* : Packing group

15 . Regulatory information

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canada inventory : All ingredients are listed or exempted.

16 . Other information

Additional information : **This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.**

Other special considerations : May contain traces of propylene oxide. Propylene oxide has been reported to be a potential carcinogen.

Regulatory Affairs Department : 1 800 665-6553

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Potassium Amyl Xanthate Safety Data Sheets

SAFETY DATA SHEETS

According to the UN GHS revision 8

Crea
Revi

SECTION 1: Identification

1.1 GHS Product identifier

Product name Potassium O-pentyl dithiocarbonate

1.2 Other means of identification

Product number -
Other names Potassium pentylxanthate;pentyloksantogenian potasowy;Aeroxanthate

1.3 Recommended use of the chemical and restrictions on use

Identified uses Processing aids, not otherwise listed,Solids separation agents
Uses advised against no data available

1.4 Supplier's details

Company Echemi.com
Address Echemi.com
Telephone Echemi.com

1.5 Emergency phone number

Emergency phone number Echemi.com
Service hours Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Flammable solids, Category 1
Acute toxicity - Category 4, Oral
Acute toxicity - Category 4, Dermal
Skin irritation, Category 2
Eye irritation, Category 2
Specific target organ toxicity â“ single exposure, Category 3

2.2 GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger
Hazard statement(s)
H228 Flammable solid
H302 Harmful if swallowed
H312 Harmful in contact with skin
H315 Causes skin irritation
H319 Causes serious eye irritation
H335 May cause respiratory irritation

Precautionary statement(s)
Prevention
P210 Keep away from heat, hot surfaces, sparks, open flames
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof [electrical/ventilating/lighting/...]
P280 Wear protective gloves/protective clothing/eye protecti
P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.

Response
P370+P378 In case of fire: Use ... to extinguish.
P301+P317 IF SWALLOWED: Get medical help.
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of water/...
P317 Get medical help.
P321 Specific treatment (see ... on this label).
P362+P364 Take off contaminated clothing and wash it befo
P332+P317 If skin irritation occurs: Get medical help.
P305+P351+P338 IF IN EYES: Rinse cautiously with water
Continue rinsing.

	P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P319 Get medical help if you feel unwell.
Storage	P403+P233 Store in a well-ventilated place. Keep container tightly closed. P405 Store locked up.
Disposal	P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and r and product characteristics at time of disposal.

2.3 Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concent
Potassium O-pentyl dithiocarbonate	Potassium O-pentyl dithiocarbonate	2720-73-2	220-329-5	100

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Move the victim into fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and consult a doctor immediately. Do not use mouth to mouth resuscitatio victim ingested or inhaled the chemical.

Following skin contact

Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

Following eye contact

Rinse with pure water for at least 15 minutes. Consult a doctor.

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

4.2 Most important symptoms/effects, acute and delayed

no data available

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

no data available

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Use dry chemical, carbon dioxide or alcohol-resistant foam.

5.2 Specific hazards arising from the chemical

no data available

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing mist, gas or vapours.Avoid contacting with skin and eye. Use personal protective equipment.Wear chemical impermeable gloves. Ensure a ventilation.Remove all sources of ignition. Evacuate personnel to safe areas.Keep people away from and upwind of spill/leak.

6.2 Environmental precautions

Prevent further spillage or leakage if it is safe to do so. Do not let the chemical enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Collect and arrange disposal. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. A collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caus electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Store the container tightly closed in a dry, cool and well-ventilated place. Store apart from foodstuff containers or incompatible materials.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

no data available

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

Skin protection

Wear fire/flame resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the sp of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

If the exposure limits are exceeded, irritation or other symptoms are experienced, use a full-face respirator.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state	DryPowder,Liquid,PelletsLargeCrystals
Colour	no data available
Odour	no data available
Melting point/freezing point	19.5~21.5â„ƒ
Boiling point or initial boiling point and boiling range	190.7ÂºC at 760 mmHg
Flammability	no data available
Lower and upper explosion limit/flammability limit	no data available
Flash point	69.1ÂºC
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	no data available
Partition coefficient n-octanol/water	no data available
Vapour pressure	no data available
Density and/or relative density	1.22
Relative vapour density	no data available
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

no data available

10.3 Possibility of hazardous reactions

no data available

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

no data available

10.6 Hazardous decomposition products

no data available

SECTION 11: Toxicological information

Acute toxicity

Oral: no data available
Inhalation: no data available
Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

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

Aspiration hazard

no data available

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish: no data available
Toxicity to daphnia and other aquatic invertebrates: no data available
Toxicity to algae: no data available
Toxicity to microorganisms: no data available

12.2 Persistence and degradability

no data available

12.3 Bioaccumulative potential

no data available

12.4 Mobility in soil

no data available

12.5 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and the disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

14.1 UN Number

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, pl check.)

14.2 UN Proper Shipping Name

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, pl check.)

14.3 Transport hazard class(es)

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, pl check.)

14.4 Packing group, if applicable

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, pl check.)

14.5 Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC
Potassium O-pentyl dithiocarbonate	Potassium O-pentyl dithiocarbonate	2720-73-2	22
European Inventory of Existing Commercial Chemical Substances (EINECS)			
EC Inventory			
United States Toxic Substances Control Act (TSCA) Inventory			
China Catalog of Hazardous chemicals 2015			No
New Zealand Inventory of Chemicals (NZIoC)			
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			
Vietnam National Chemical Inventory			No
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			
Korea Existing Chemicals List (KECL)			

SECTION 16: Other information

Information on revision

Creation Date July 15, 2019
Revision Date July 15, 2019

Abbreviations and acronyms

CAS: Chemical Abstracts Service
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
IMDG: International Maritime Dangerous Goods
IATA: International Air Transportation Association
TWA: Time Weighted Average
STEL: Short term exposure limit
LC50: Lethal Concentration 50%
LD50: Lethal Dose 50%
EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home
HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm
IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/
eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple
ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp
ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg
Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp
ECHA - European Chemicals Agency, website: https://echa.europa.eu/

Any questions regarding this SDS, Please send your inquiry to sds@xixisys.com

Disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. We as supplie be held liable for any damage resulting from handling or from contact with the above product.

SAFETY DATA SHEET

1,3,7-Trimethylxanthine - USP

According to Regulation (EC) No 1907/2006, Annex II, as amended. Commission Regulation (EU) No 2015/830 of 28 May 2015.

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name 1,3,7-Trimethylxanthine - USP

Product number FT172495

CAS number 58-08-2

EC number 200-362-1

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

Identified uses Laboratory reagent. Manufacture of substances. Research and development.

1.3. Details of the supplier of the safety data sheet

Supplier

Carbosynth Ltd
8&9 Old Station Business Park
Compton
Berkshire
RG20 6NE
UK
+44 1635 578444
+44 1635 579444
info@carbosynth.com

1.4. Emergency telephone number

Emergency telephone +44 7887 998634

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards Not Classified

Health hazards Acute Tox. 3 - H301

Environmental hazards Not Classified

2.2. Label elements

EC number 200-362-1

Hazard pictograms

Signal word Danger

Hazard statements H301 Toxic if swallowed.

1,3,7-Trimethylxanthine - USP

Precautionary statements P264 Wash contaminated skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P321 Specific treatment (see medical advice on this label).
P330 Rinse mouth.
P501 Dispose of contents/ container in accordance with national regulations.

2.3. Other hazards

No data available.

SECTION 3: Composition/information on ingredients

3.1. Substances

Product name 1,3,7-Trimethylxanthine - USP

CAS number 58-08-2

EC number 200-362-1

Chemical formula $C_8H_{10}N_4O_2$

SECTION 4: First aid measures

4.1. Description of first aid measures

General information Get medical advice/attention if you feel unwell.

Inhalation Remove person to fresh air and keep comfortable for breathing. If breathing stops, provide artificial respiration. When breathing is difficult, properly trained personnel may assist affected person by administering oxygen. Get medical attention if symptoms are severe or persist.

Ingestion Do not induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth thoroughly with water. Give plenty of water to drink. Get medical attention if symptoms are severe or persist.

Skin contact Remove contaminated clothing. Rinse with water. Continue to rinse for at least 15 minutes. Wash contaminated clothing before reuse. Get medical attention if symptoms are severe or persist.

Eye contact Rinse immediately with plenty of water. Continue to rinse for at least 15 minutes. Get medical attention if symptoms are severe or persist.

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

General information See Section 11 for additional information on health hazards.

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

Notes for the doctor Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog. Use fire-extinguishing media suitable for the surrounding fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards None known.

Hazardous combustion products Thermal decomposition or combustion products may include the following substances: Oxides of carbon. Oxides of nitrogen.

5.3. Advice for firefighters

1,3,7-Trimethylxanthine - USP

Special protective equipment for firefighters Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing. Firefighter's clothing conforming to European standard EN469 (including helmets, protective boots and gloves) will provide a basic level of protection for chemical incidents. Use protective equipment appropriate for surrounding materials.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Wear protective clothing as described in Section 8 of this safety data sheet. No action shall be taken without appropriate training or involving any personal risk. Do not touch or walk into spilled material. Avoid inhalation of dust and vapours. Provide adequate ventilation. Keep unnecessary and unprotected personnel away from the spillage.

6.2. Environmental precautions

Environmental precautions Avoid discharge into drains or watercourses or onto the ground.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Wear protective clothing as described in Section 8 of this safety data sheet. Collect powder using special dust vacuum cleaner with particle filter or carefully sweep into suitable waste disposal containers and seal securely. Clear up spills immediately and dispose of waste safely. Flush contaminated area with plenty of water. Wash thoroughly after dealing with a spillage. For waste disposal, see Section 13.

6.4. Reference to other sections

Reference to other sections For personal protection, see Section 8. See Section 11 for additional information on health hazards. See Section 12 for additional information on ecological hazards. For waste disposal, see Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Wear protective clothing as described in Section 8 of this safety data sheet. Wash hands thoroughly after handling. Provide adequate ventilation. Avoid generation and spreading of dust. Avoid contact with skin and eyes. Avoid inhalation of dust and vapours. Do not eat, drink or smoke when using this product.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Keep container tightly closed. Store in a cool and well-ventilated place. Protect from light. Store at room temperature.

7.3. Specific end use(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

SECTION 8: Exposure controls/Personal protection

8.1. Control parameters

8.2. Exposure controls

Appropriate engineering controls Provide adequate ventilation. Observe any occupational exposure limits for the product or ingredients.

Eye/face protection Unless the assessment indicates a higher degree of protection is required, the following protection should be worn: Tight-fitting safety glasses. Personal protective equipment for eye and face protection should comply with European Standard EN166.

Hand protection Wear protective gloves. To protect hands from chemicals, gloves should comply with European Standard EN374.

1,3,7-Trimethylxanthine - USP

Other skin and body protection	Wear appropriate clothing to prevent repeated or prolonged skin contact.
Respiratory protection	Respiratory protection complying with an approved standard should be worn if a risk assessment indicates inhalation of contaminants is possible. Ensure all respiratory protective equipment is suitable for its intended use and is 'CE'-marked. Particulate filters should comply with European Standard EN143. Full face mask respirators with replaceable filter cartridges should comply with European Standard EN136. Half mask and quarter mask respirators with replaceable filter cartridges should comply with European Standard EN140.
Environmental exposure controls	Keep container tightly sealed when not in use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Solid.
Colour	White/off-white.
Odour	Odourless.
Odour threshold	No data available.
pH	pH (diluted solution): 6.9 (1% water solution)
Melting point	235 to 238°C
Initial boiling point and range	No data available.
Flash point	No data available.
Evaporation rate	No data available.
Flammability (solid, gas)	No data available.
Upper/lower flammability or explosive limits	No data available.
Vapour pressure	2.0 kPa @ 89°C
Vapour density	No data available.
Relative density	No data available.
Solubility(ies)	Slightly soluble in water. Soluble in the following materials: THF Chloroform. DMSO Ethyl Acetate Pyridine Almost insoluble in the following materials: Ether. Alcohols. Acetone. Benzene.
Partition coefficient	log Pow: -0.07
Auto-ignition temperature	540°C
Decomposition Temperature	No data available.
Viscosity	No data available.
Explosive properties	No data available.
Oxidising properties	No data available.

9.2. Other information

Molecular weight	194.19

SECTION 10: Stability and reactivity

1,3,7-Trimethylxanthine - USP

10.1. Reactivity

Reactivity No data available.

10.2. Chemical stability

Stability Stable under the prescribed storage conditions.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions No data available.

10.4. Conditions to avoid

Conditions to avoid No data available.

10.5. Incompatible materials

Materials to avoid Strong oxidising agents.

10.6. Hazardous decomposition products

Hazardous decomposition products Oxides of carbon. Oxides of nitrogen.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity - oral

Acute toxicity oral (LD_{50} mg/kg) 192.0

Species Rat

Notes (oral LD_{50}) Acute Tox. 3 - H301 Toxic if swallowed.

ATE oral (mg/kg) 192.0

Acute toxicity - dermal

Notes (dermal LD_{50}) Based on available data the classification criteria are not met.

Acute toxicity - inhalation

Notes (inhalation LC_{50}) Based on available data the classification criteria are not met.

Skin corrosion/irritation

Animal data Based on available data the classification criteria are not met.

Serious eye damage/irritation

Serious eye damage/irritation Based on available data the classification criteria are not met.

Respiratory sensitisation

Respiratory sensitisation Based on available data the classification criteria are not met.

Skin sensitisation

Skin sensitisation Based on available data the classification criteria are not met.

Germ cell mutagenicity

Genotoxicity - in vitro Based on available data the classification criteria are not met.

Carcinogenicity

Carcinogenicity Based on available data the classification criteria are not met.

IARC carcinogenicity IARC Group 3 Not classifiable as to its carcinogenicity to humans.

1,3,7-Trimethylxanthine - USP

Reproductive toxicity

Reproductive toxicity - fertility Based on available data the classification criteria are not met.

Reproductive toxicity - development Based on available data the classification criteria are not met.

Specific target organ toxicity - single exposure

STOT - single exposure Not classified as a specific target organ toxicant after a single exposure.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure Not classified as a specific target organ toxicant after repeated exposure.

Aspiration hazard

Aspiration hazard Not relevant. Solid.

General information Dust may irritate the eyes and the respiratory system. The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

Inhalation Dust may irritate the respiratory system. Frequent inhalation of dust over a long period of time increases the risk of developing lung diseases.

Ingestion May cause stomach pain or vomiting. May cause severe internal injury.

Skin contact Prolonged contact may cause dryness of the skin.

Eye contact Dust may cause slight irritation.

Route of exposure Ingestion Inhalation Skin and/or eye contact

Target organs No specific target organs known.

RTECS # EV6475000

SECTION 12: Ecological information

Ecotoxicity Not regarded as dangerous for the environment. However, large or frequent spills may have hazardous effects on the environment.

12.1. Toxicity

Acute aquatic toxicity

Acute toxicity - fish LC_{50}, 96 hour: 87 mg/l, Leuciscus idus (Golden orfe)

Acute toxicity - aquatic invertebrates EC_{50}, 48 hour: 182 mg/l, Daphnia magna

12.2. Persistence and degradability

Persistence and degradability The degradability of the product is not known.

12.3. Bioaccumulative potential

Bioaccumulative potential No data available on bioaccumulation.

Partition coefficient log Pow: -0.07

12.4. Mobility in soil

Mobility No data available.

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment No data available.

1,3,7-Trimethylxanthine - USP

12.6. Other adverse effects

Other adverse effects Harmful to aquatic life.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority. This material and its container must be disposed of in a safe way. When handling waste, the safety precautions applying to handling of the product should be considered.

SECTION 14: Transport information

14.1. UN number

UN No. (ADR/RID) 1544

UN No. (IMDG) 1544

UN No. (ICAO) 1544

UN No. (ADN) 1544

14.2. UN proper shipping name

Proper shipping name (ADR/RID) ALKALOIDS, SOLID, N.O.S. (1,3,7-Trimethylxanthine)

Proper shipping name (IMDG) ALKALOIDS, SOLID, N.O.S. (1,3,7-Trimethylxanthine)

Proper shipping name (ICAO) ALKALOIDS, SOLID, N.O.S. (1,3,7-Trimethylxanthine)

Proper shipping name (ADN) ALKALOIDS, SOLID, N.O.S. (1,3,7-Trimethylxanthine)

14.3. Transport hazard class(es)

ADR/RID class 6.1

ADR/RID classification code T2

ADR/RID label 6.1

IMDG class 6.1

ICAO class/division 6.1

ADN class 6.1

Transport labels

14.4. Packing group

ADR/RID packing group III

IMDG packing group III

ICAO packing group III

ADN packing group III

14.5. Environmental hazards

1,3,7-Trimethylxanthine - USP

Environmentally hazardous substance/marine pollutant

No.

14.6. Special precautions for user

EmS	F-A, S-A
ADR transport category	2
Emergency Action Code	2X
Hazard Identification Number (ADR/RID)	60
Tunnel restriction code	(E)

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

SECTION 15: Regulatory information

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

National regulations	Health and Safety at Work etc. Act 1974 (as amended). The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (SI 2009 No. 1348) (as amended) ["CDG 2009"]. EH40/2005 Workplace exposure limits.
EU legislation	Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended). Commission Regulation (EU) No 2015/830 of 28 May 2015. Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).

15.2. Chemical safety assessment

No chemical safety assessment has been carried out.

Inventories

US - TSCA

Present.

SECTION 16: Other information

Abbreviations and acronyms used in the safety data sheet

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.
ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways.
RID: European Agreement concerning the International Carriage of Dangerous Goods by Rail.
IATA: International Air Transport Association.
ICAO: Technical Instructions for the Safe Transport of Dangerous Goods by Air.
IMDG: International Maritime Dangerous Goods.
CAS: Chemical Abstracts Service.
ATE: Acute Toxicity Estimate.
LC_{50}: Lethal Concentration to 50 % of a test population.
LD_{50}: Lethal Dose to 50% of a test population (Median Lethal Dose).
EC_{50}: 50% of maximal Effective Concentration.
PBT: Persistent, Bioaccumulative and Toxic substance.
vPvB: Very Persistent and Very Bioaccumulative.

1,3,7-Trimethylxanthine - USP

Training advice	Only trained personnel should use this material.
Revision date	04/11/2019
Revision	2
Supersedes date	09/10/2019
Hazard statements in full	H301 Toxic if swallowed.

Methyl Isobutyl Carbinol

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 04/06/2018 Revision date: 04/06/2018 Supersedes: 06/01/2015

SECTION 1: Identification

1.1. Identification

Product form	:	Substance
Trade name	:	Methyl Isobutyl Carbinol
Chemical name	:	Methyl Isobutyl Carbinol
CAS-No.	:	108-11-2
Product code	:	HP-040788-FP
Formula	:	C6H14O
Synonyms	:	Isobutylmethylmethanol / 2-Methyl-4-pentanol / Pentan-2-ol, 4-methyl- / 4-Pentanol, 2-methyl- / Methyl-2-pentanol, 4- / 4-Methyl-2-pentanol / 4-Methylpentan-2-ol / 1,3-Dimethyl-1-butanol / MIBC / Methylisobutylcarbinol / 4-Methyl-2-amyl alcohol / Methyl isobutyl carbinol / Methyl(2-methylpropyl) carbinol / 4-Methylpent-2-one

1.2. Recommended use and restrictions on use

Use of the substance/mixture	:	Solvent, organic synthesis, brake fluids
Use of the substance/mixture	:	Solvent

1.3. Supplier

Monument Chemical
16717 Jacintoport Blvd.
Houston, TX 77015 - USA
T (281) 452-5951 - F (281) 457-1127
sds@monumentchemical.com - www.monumentchemical.com

1.4. Emergency telephone number

Emergency number : 24 HR CHEMTREC: 1-800-424-9300; 24 HR Emergency Assistance: 1-832-376-2026

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Flammable liquids Category 3	H226	Flammable liquid and vapour
Serious eye damage/eye irritation Category 2A	H319	Causes serious eye irritation
Specific target organ toxicity (single exposure) Category 3	H335	May cause respiratory irritation

Full text of H statements : see section 16

2.2. GHS Label elements, including precautionary statements

GHS-US labeling

Hazard pictograms (GHS-US) :

Signal word (GHS-US) : Warning

Hazard statements (GHS-US) :
H226 - Flammable liquid and vapour
H319 - Causes serious eye irritation
H335 - May cause respiratory irritation

Precautionary statements (GHS-US) :
P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking.
P233 - Keep container tightly closed.
P240 - Ground/Bond container and receiving equipment
P241 - Use explosion-proof electrical, lighting, ventilating equipment
P242 - Use only non-sparking tools.
P243 - Take precautionary measures against static discharge.
P261 - Avoid breathing dust, fume, gas, mist, spray, vapors.
P264 - Wash hands, forearms and face thoroughly after handling.
P271 - Use only outdoors or in a well-ventilated area.
P280 - Wear eye protection, protective clothing, protective gloves.

P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P312 - Call a doctor, a POISON CENTER if you feel unwell
P337+P313 - If eye irritation persists: Get medical advice/attention.
P370+P378 - In case of fire: Use alcohol resistant foam, carbon dioxide (CO2), dry extinguishing powder, Water spray to extinguish.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P403+P235 - Store in a well-ventilated place. Keep cool.
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 which do not result in classification

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances

Substance type : Mono-constituent

Name	Product identifier	%
Methyl Isobutyl Carbinol (Main constituent)	(CAS-No.) 108-11-2	>= 99

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

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general : Call a poison center/doctor/physician if you feel unwell.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor/physician if you feel unwell.

First-aid measures after skin contact : Rinse skin with water/shower. Remove/Take off immediately all contaminated clothing.

First-aid measures after eye contact : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

First-aid measures after ingestion : Call a poison center/doctor/physician if you feel unwell.

4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects after inhalation : May cause respiratory irritation.

Symptoms/effects after skin contact : Slight irritation. Red skin. Dry skin. Itching.

Symptoms/effects after eye contact : Irritation of the eye tissue. Eye irritation.

Symptoms/effects after ingestion : Vomiting. Abdominal pain. AFTER INGESTION OF HIGH QUANTITIES: Dizziness. Headache. Disturbances of consciousness.

Chronic symptoms : No effects known.

4.3. Immediate medical attention and special treatment, if necessary

Treat symptomatically.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Water spray. Dry powder. Foam. Carbon dioxide.

5.2. Specific hazards arising from the chemical

Fire hazard : Flammable liquid and vapour.

Reactivity : Reacts with (some) acids: (increased) risk of fire/explosion. Reacts violently with (strong) oxidizers: (increased) risk of fire/explosion. Flammable liquid and vapour.

5.3. Special protective equipment and precautions for fire-fighters

Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment : Gloves. Protective clothing. Large spills/in enclosed spaces: compressed air apparatus.

Emergency procedures : Ventilate spillage area. No open flames, no sparks, and no smoking. Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid contact with skin and eyes.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain released product, pump into suitable containers. Plug the leak, cut off the supply. Dam up the liquid spill. Provide equipment/receptacles with earthing. Do not use compressed air for pumping over spills. Heating: dilute combustible gas/vapour with water curtain.

Methods for cleaning up : Take up liquid spill into absorbent material. Notify authorities if product enters sewers or public waters.

Other information : Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground/bond container and receiving equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Flammable vapors may accumulate in the container. Use explosion-proof equipment. Wear personal protective equipment. Use only outdoors or in a well-ventilated area. Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid contact with skin and eyes.

Hygiene measures : Observe normal hygiene standards. Keep container tightly closed. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Ground/bond container and receiving equipment.

Storage conditions : Store in a well-ventilated place. Keep cool. Keep container tightly closed. Store locked up.

Heat-ignition : KEEP SUBSTANCE AWAY FROM: heat sources. ignition sources.

Information on mixed storage : KEEP SUBSTANCE AWAY FROM: oxidizing agents. (strong) acids. (strong) bases. amines.

Storage area : Ventilation at floor level. Fireproof storeroom. Provide for a tub to collect spills. Provide the tank with earthing. Store at ambient temperature. Meet the legal requirements.

Special rules on packaging : SPECIAL REQUIREMENTS: closing. clean. correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.

Packaging materials : SUITABLE MATERIAL: steel. stainless steel. carbon steel. aluminium. zinc. polyethylene. glass. tin.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Methyl Isobutyl Carbinol (108-11-2)		
ACGIH	Local name	Methyl isobutyl carbinol
ACGIH	ACGIH TWA (ppm)	25 ppm [SKIN]
ACGIH	ACGIH STEL (ppm)	40 ppm
ACGIH	Remark (ACGIH)	URT & eye irr; CNS impair
ACGIH	Regulatory reference	ACGIH 2018
OSHA	OSHA PEL (TWA) (mg/m³)	100 mg/m³
OSHA	OSHA PEL (TWA) (ppm)	25 ppm [SKIN]
OSHA	Limit value category (OSHA)	prevent or reduce skin absorption

Methyl Isobutyl Carbinol (108-11-2)		
OSHA	Regulatory reference (US-OSHA)	OSHA
IDLH	US IDLH (ppm)	400 ppm
NIOSH	NIOSH REL (TWA) (mg/m³)	100 mg/m³
NIOSH	NIOSH REL (TWA) (ppm)	25 ppm [SKIN]
NIOSH	NIOSH REL (STEL) (mg/m³)	165 mg/m³
NIOSH	NIOSH REL (STEL) (ppm)	40 ppm
NIOSH	US-NIOSH chemical category	Potential for dermal absorption

8.2. Appropriate engineering controls

Appropriate engineering controls : Ensure good ventilation of the work station.

Environmental exposure controls : Avoid release to the environment.

8.3. Individual protection measures/Personal protective equipment

Materials for protective clothing:

GIVE EXCELLENT RESISTANCE: butyl rubber. GIVE GOOD RESISTANCE: butyl rubber. PVC. neoprene

Hand protection:

Protective gloves

Eye protection:

Safety glasses

Skin and body protection:

Protective clothing

Respiratory protection:

In case of insufficient ventilation, wear suitable respiratory equipment

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Appearance	:	Clear, colorless liquid.
Color	:	Colorless
Odor	:	mild
Odor threshold	:	No data available
pH	:	No data available
Melting point	:	-90 °C
Freezing point	:	-90 °C ; -130.0 °F
Boiling point	:	132 °C ; 269.6 °F
Critical temperature	:	291 °C
Flash point	:	41 °C ; 105.8 °F closed cup
Relative evaporation rate (butyl acetate=1)	:	0.3
Relative evaporation rate (ether=1)	:	33
Flammability (solid, gas)	:	Not applicable.
Vapor pressure	:	2.8 mm Hg (at 25 °C)
Vapor pressure at 50 °C	:	34 hPa
Relative vapor density at 20 °C	:	3.5
Relative density	:	0.82
Relative density of saturated gas/air mixture	:	1
Specific gravity / density	:	807.5 kg/m³ (at 20 °C)
Molecular mass	:	102.2 g/mol

Solubility	:	Moderately soluble in water. Soluble in ethanol. Soluble in ether. Water: 2 g/100ml (at 25 °C)
Log Pow	:	1.43 (at 25 °C)
Auto-ignition temperature	:	305 °C ; 581 °F
Decomposition temperature	:	No data available
Viscosity, kinematic	:	5.08 mm²/s (25 °C)
Viscosity, dynamic	:	4.116 mPa.s (25 °C)
Explosion limits	:	1 - 5.5 vol % 42 - 235 g/m³ LEL: 1 vol % UEL: 5.5 vol %
Explosive properties	:	No data available
Oxidizing properties	:	No data available

9.2. Other information

Specific conductivity	:	70000 pS/m
Saturation concentration	:	25 g/m³
VOC content	:	100 %
Other properties	:	Gas/vapour heavier than air at 20°C. Clear. Slightly volatile. Substance has neutral reaction. May generate electrostatic charges.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reacts with (some) acids: (increased) risk of fire/explosion. Reacts violently with (strong) oxidizers: (increased) risk of fire/explosion. Flammable liquid and vapour.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

Avoid contact with hot surfaces. Heat. No flames, no sparks. Eliminate all sources of ignition.

10.5. Incompatible materials

No additional information available

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Methyl Isobutyl Carbinol (108-11-2)	
LD50 oral rat	2600 mg/kg
LD50 dermal rabbit	2880 mg/kg
LC50 inhalation rat (mg/l)	> 16000 mg/m³ (Equivalent or similar to OECD 403, 4 h, Rat, Male/female, Experimental value)
LC50 inhalation rat (ppm)	> 4600 ppm (Exposure time: 2 h)
ATE US (oral)	2600 mg/kg body weight
ATE US (dermal)	2880 mg/kg body weight

Skin corrosion/irritation	:	Not classified
Serious eye damage/irritation	:	Causes serious eye irritation.
Respiratory or skin sensitization	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
Specific target organ toxicity – single exposure	:	May cause respiratory irritation.

Specific target organ toxicity – repeated exposure	:	Not classified
Aspiration hazard	:	Not classified
Symptoms/effects after inhalation	:	May cause respiratory irritation.
Symptoms/effects after skin contact	:	Slight irritation. Red skin. Dry skin. Itching.
Symptoms/effects after eye contact	:	Irritation of the eye tissue. Eye irritation.
Symptoms/effects after ingestion	:	Vomiting. Abdominal pain. AFTER INGESTION OF HIGH QUANTITIES: Dizziness. Headache. Disturbances of consciousness.
Chronic symptoms	:	No effects known.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general	:	Not classified as dangerous for the environment according to the criteria of Regulation (EC) No 1272/2008.
Ecology - air	:	Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 517/2014). Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009).

Methyl Isobutyl Carbinol (108-11-2)	
LC50 fish 1	360 mg/l 24hr; Goldfish

12.2. Persistence and degradability

Methyl Isobutyl Carbinol (108-11-2)	
Biochemical oxygen demand (BOD)	2.12 g O_2/g substance
Chemical oxygen demand (COD)	2.6 g O_2/g substance
ThOD	2.8 g O_2/g substance
BOD (% of ThOD)	0.76 (Calculated value)

12.3. Bioaccumulative potential

Methyl Isobutyl Carbinol (108-11-2)	
Log Pow	1.43 (at 25 °C)

12.4. Mobility in soil

Methyl Isobutyl Carbinol (108-11-2)	
Surface tension	0.023 N/m
Ecology - soil	No (test)data on mobility of the substance available.

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods

Regional legislation (waste)	:	LWCA (the Netherlands): KGA category 03.
Waste treatment methods	:	Dispose of contents/container in accordance with licensed collector's sorting instructions.
Additional information	:	Flammable vapors may accumulate in the container.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description	:	UN2053 Methyl isobutyl carbinol, 3, III
UN-No.(DOT)	:	UN2053
Proper Shipping Name (DOT)	:	Methyl isobutyl carbinol
Class (DOT)	:	3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120
Packing group (DOT)	:	III - Minor Danger

Hazard labels (DOT)	:	3 - Flammable liquid

DOT Packaging Non Bulk (49 CFR 173.xxx)	:	203
DOT Packaging Bulk (49 CFR 173.xxx)	:	242
DOT Special Provisions (49 CFR 172.102)	:	B1 - If the material has a flash point at or above 38 C (100 F) and below 93 C (200 F), then the bulk packaging requirements of 173.241 of this subchapter are applicable. If the material has a flash point of less than 38 C (100 F), then the bulk packaging requirements of 173.242 of this subchapter are applicable. IB3 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1 and 31HA2, 31HB2, 31HN2, 31HD2 and 31HH2). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized, except for UN2672 (also see Special Provision IP8 in Table 2 for UN2672). T2 - 1.5 178.274(d)(2) Normal..... 178.275(d)(3) TP1 - The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling = 97 / 1 + a (tr - tf) Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees celsius of the liquid during filling.
DOT Packaging Exceptions (49 CFR 173.xxx)	:	150
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	:	60 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	:	220 L
DOT Vessel Stowage Location	:	A - The material may be stowed ‘‘on deck’’ or ‘‘under deck’’ on a cargo vessel and on a passenger vessel.
Emergency Response Guide (ERG) Number	:	129
Other information	:	No supplementary information available.

Transport by sea

Transport document description (IMDG)	:	UN 2053 METHYL ISOBUTYL CARBINOL, 3, III (41°C c.c.)
UN-No. (IMDG)	:	2053
Proper Shipping Name (IMDG)	:	METHYL ISOBUTYL CARBINOL
Class (IMDG)	:	3 - Flammable liquids
Packing group (IMDG)	:	III - substances presenting low danger
Limited quantities (IMDG)	:	5 L
EmS-No. (1)	:	F-E
EmS-No. (2)	:	S-D

Air transport

Transport document description (IATA)	:	UN 2053 Methyl isobutyl carbinol, 3, III
UN-No. (IATA)	:	2053
Proper Shipping Name (IATA)	:	Methyl isobutyl carbinol
Class (IATA)	:	3 - Flammable Liquids
Packing group (IATA)	:	III - Minor Danger

SECTION 15: Regulatory information

15.1. US Federal regulations

Methyl Isobutyl Carbinol (108-11-2)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

CANADA

Methyl Isobutyl Carbinol (108-11-2)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Methyl Isobutyl Carbinol (108-11-2)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

National regulations

Methyl Isobutyl Carbinol (108-11-2)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on the Japanese ISHL (Industrial Safety and Health Law) Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on CICR (Turkish Inventory and Control of Chemicals) Listed on the TCSI (Taiwan Chemical Substance Inventory)

15.3. US State regulations

Methyl Isobutyl Carbinol (108-11-2)	
State or local regulations	U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Revision date : 04/06/2018

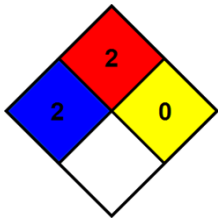
Full text of H-phrases:

H226	Flammable liquid and vapour
H319	Causes serious eye irritation
H335	May cause respiratory irritation

NFPA health hazard : 2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.

NFPA fire hazard : 2 - Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur.

NFPA reactivity : 0 - Material that in themselves are normally stable, even under fire conditions.



SDS US (GHS HazCom 2012)

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SAFETY DATA SHEET

Creation Date 09-Apr-2010 **Revision Date** 23-Jan-2018 **Revision Number** 4

1. Identification

Product Name **Copper(II) sulfate**

Cat No. : **AC422870000; AC422870025; AC422870050; AC422870100; AC422871000; AC422875000**

CAS-No 7758-98-7
Synonyms Cupric sulfate anhydrous; Cupric sulfate; Copper monosulfate

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company

Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number
For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute oral toxicity	Category 4
Skin Corrosion/Irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2

Label Elements

Signal Word
Warning

Hazard Statements
Harmful if swallowed
Causes skin irritation
Causes serious eye irritation

Precautionary Statements
Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Wear protective gloves/protective clothing/eye protection/face protection
Skin
IF ON SKIN: Wash with plenty of soap and water
If skin irritation occurs: Get medical advice/attention
Take off contaminated clothing and wash before reuse
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Ingestion
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
Rinse mouth
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Very toxic to aquatic life with long lasting effects

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
Cupric sulfate	7758-98-7	98

4. First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Get medical attention if symptoms occur.

Inhalation Remove to fresh air. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention. If not breathing, give artificial respiration.

Ingestion Do NOT induce vomiting. Call a physician or poison control center immediately.

Most important symptoms and effects No information available.

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.

Unsuitable Extinguishing Media No information available

Flash Point No information available
Method - No information available

Autoignition Temperature No information available
Explosion Limits
Upper No data available
Lower No data available
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical
Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Do not allow run-off from fire-fighting to enter drains or water courses.

Hazardous Combustion Products
Toxic fumes. Sulfur oxides. Copper oxides.
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
2	0	1	N/A

6. Accidental release measures

Personal Precautions Use personal protective equipment as required. Ensure adequate ventilation. Avoid dust formation. Avoid contact with skin, eyes or clothing.

Environmental Precautions Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained. Should not be released into the environment.

Methods for Containment and Clean Up Sweep up and shovel into suitable containers for disposal. Avoid dust formation.

7. Handling and storage

Handling Wear personal protective equipment/face protection. Ensure adequate ventilation. Avoid dust formation. Avoid contact with skin, eyes or clothing. Avoid ingestion and inhalation.

Storage Keep containers tightly closed in a dry, cool and well-ventilated place. Store under an inert atmosphere.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Cupric sulfate	TWA: 1 mg/m^3		IDLH: 100 mg/m^3 TWA: 1 mg/m^3	

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
NIOSH IDLH: NIOSH - National Institute for Occupational Safety and Health

Engineering Measures Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection	Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin and body protection	Wear appropriate protective gloves and clothing to prevent skin exposure.
Respiratory Protection	Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
Hygiene Measures	Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Powder Solid
Appearance	Grey
Odor	Odorless
Odor Threshold	No information available
pH	3.5-4.5
Melting Point/Range	200 °C / 392 °F
Boiling Point/Range	No information available
Flash Point	No information available
Evaporation Rate	Not applicable
Flammability (solid,gas)	No information available
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	No information available
Vapor Density	Not applicable
Specific Gravity	3.6
Solubility	203 g/L (20°C)
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	No information available
Viscosity	Not applicable
Molecular Formula	Cu O4 S
Molecular Weight	159.6

10. Stability and reactivity

Reactive Hazard	None known, based on information available
Stability	Stable under normal conditions. Hygroscopic.
Conditions to Avoid	Avoid dust formation. Incompatible products. Excess heat. Exposure to moisture.
Incompatible Materials	Strong bases, Metals, Alkali metals, Finely powdered metals
Hazardous Decomposition Products	Toxic fumes, Sulfur oxides, Copper oxides
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Cupric sulfate	LD50 = 481 mg/kg (Rat)	LD50 > 1000 mg/kg (Rabbit)	Not listed

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Irritating to eyes and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Cupric sulfate	7758-98-7	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure None known

STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed No information available

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Do not allow material to contaminate ground water system. The product contains following substances which are hazardous for the environment.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Cupric sulfate	Not listed	LC50: = 0.1 mg/L, 96h (Oncorhynchus mykiss)	Not listed	EC50 = 0.024 mg/L/48h

Persistence and Degradability May persist based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its water solubility.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No UN3077

Proper Shipping Name Environmentally hazardous substances, solid, n.o.s.
Technical Name Cupric sulfate
Hazard Class 9
Packing Group III

TDG

UN-No UN3077
Proper Shipping Name Environmentally hazardous substances, solid, n.o.s.
Hazard Class 9
Packing Group III

IATA

UN-No UN3077
Proper Shipping Name Environmentally hazardous substances, solid, n.o.s.
Hazard Class 9
Packing Group III

IMDG/IMO

UN-No UN3077
Proper Shipping Name Environmentally hazardous substances, solid, n.o.s.
Hazard Class 9
Packing Group III

15. Regulatory information

United States of America Inventory

Component	CAS-No	TSCA	TSCA Inventory notification - Active/Inactive	TSCA - EPA Regulatory Flags
Cupric sulfate	7758-98-7	X	ACTIVE	-

Legend:
TSCA - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed

TSCA 12(b) - Notices of Export Not applicable

International Inventories
Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Australia (AICS), China (IECSC), Korea (ECL).

Component	CAS-No	DSL	NDSL	EINECS	PICCS	ENCS	AICS	IECSC	KECL
Cupric sulfate	7758-98-7	X	-	231-847-6	X	X	X	X	KE-08956

U.S. Federal Regulations

SARA 313

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Cupric sulfate	7758-98-7	98	1.0

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Cupric sulfate	X	10 lb	X	-

Clean Air Act Not applicable

OSHA - Occupational Safety and Health Administration Not applicable

CERCLA This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Cupric sulfate	10 lb	-

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Cupric sulfate	X	X	X	-	-

U.S. Department of Transportation

Reportable Quantity (RQ): N
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

16. Other information

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 09-Apr-2010
Revision Date 23-Jan-2018
Print Date 23-Jan-2018
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer

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

End of SDS

Safety Data Sheet
Pine Oil 62%, Disinfectant, Detergent

SDS Revision Date: 06/06/2019

1. Identification

1.1. Product identifier

Product Identity	Pine Oil 62%, Disinfectant, Detergent
Alternate Names	Pine Oil 62%, Disinfectant, Detergent LHB Part Number: 1064301, 1064302, 1064303 NSN 6840-00678-7940 (Quart) NSN 6840-00-584-3129 (1 Gal) NSN 6840-00-551-8346 (Drum), Unit of Issue 1 QT = 24/Case; 1Gal = 6/Case; Drum = 1 each, CAGE# 0FTT5

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

Intended use	See Product Label
Application Method	See Product Label

1.3. Details of the supplier of the safety data sheet

Company Name	LHB Industries 8833 Fleischer Place Berkeley, MO 63134
Emergency	
24 hour Emergency Telephone No.	(800) 633-8253 (PERS)
Customer Service: LHB Industries	(314) 423-4333

2. Hazard(s) identification

2.1. Classification of the substance or mixture

Combustible Liquid;H227	Combustible Liquid.
Skin Irrit. 2;H315	Causes skin irritation.
Eye Dam. 2A;H319	Causes serious eye irritation.
Asp. Tox. 1;H304	May be fatal if swallowed and enters airways.
Aquatic Chronic 2;H411	Toxic to aquatic life with long lasting effects.

2.2. Label elements

Danger

H227 Combustible liquid.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H411 Toxic to aquatic life with long lasting effects.

[Prevention]:
P210 Keep away from heat, sparks, open flames, hot surfaces - No smoking.
P235 Keep cool.
P264 Wash thoroughly after handling.
P273 Avoid release to the environment.
P280 Wear protective gloves, eye protection, face protection.
[Response]:
P301+310 IF SWALLOWED: Immediately call a POISON CENTER, doctor or physician.
P302+352 IF on skin: Wash with plenty of soap and water.
P305+351+338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.
P321 Specific treatment (see information on this label).
P331 Do NOT induce vomiting.
P332+313 If skin irritation occurs: Get medical advice or attention.
P337+313 If eye irritation persists: Get medical advice or attention.
P362 Take off contaminated clothing and wash before reuse.
P370+378 In case of fire: Use extinguishing media listed in section 5 of SDS for extinction.
P391 Collect spillage.
[Storage]:
P403+235 Store in a well ventilated place. Keep cool.
P405 Store locked up.
[Disposal]:
P501 Dispose of contents or container in accordance with local and national regulations.

3. Composition/information on ingredients

This product contains the following substances that present a hazard within the meaning of the relevant State and Federal Hazardous Substances regulations.

Ingredient/Chemical Designations	Weight %	GHS Classification	Notes
Pine oil **CAS Number: 0008002-09-3**	**50 - 75**	**Skin Irrit. 2;H315** **Eye Irrit. 2;H319** **Flam. Liq. 3;H226** **Asp. Tox. 1;H304** **Aquatic Chronic 2;H411**	**[1]**
Tall oil fatty acid **CAS Number: 0061790-12-3**	**10 - 25**	**Not Classified**	**[1]**
Isopropyl Alcohol **CAS Number: 0000067-63-0**	**1 - 5**	**Flam. Liq. 2;H225** **Eye Irrit. 2;H319** **STOT SE 3;H336**	**[1][2]**
Sodium hydroxide **CAS Number: 0001310-73-2**	**1 - 5**	**Skin Corr. 1A;H314** **Met. Corr. 1;H290**	**[1][2]**

In accordance with paragraph (i) of §1910.1200, the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.
[1] Substance with a health or environmental hazard.
[2] Substance with a workplace exposure limit.
[3] PBT-substance or vPvB-substance.
*The full texts of the phrases are shown in Section 16.

Section 4. First aid measures

4.1. Description of first aid measures

General In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person.

Inhalation Remove to fresh air, keep patient warm and at rest. If breathing is irregular or stopped, give artificial respiration. If unconscious, place in the recovery position and obtain immediate medical attention. Give nothing by mouth.

Eyes Irrigate copiously with clean water for at least 15 minutes, holding the eyelids apart and seek medical attention.

Skin Remove contaminated clothing. Wash skin thoroughly with soap and water or use a recognized skin cleanser.

Ingestion If accidentally swallowed obtain immediate medical attention. Keep at rest. Do NOT induce vomiting.

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

Overview Treat symptomatically. Exposure to solvent vapor concentrations from the component solvents in excess of the stated occupational exposure limits may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on the kidneys, liver and central nervous system. Symptoms include headache, nausea, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness.

	Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in dryness, irritation and possible non-allergic contact dermatitis. Solvents may also be absorbed through the skin. Splashes of liquid in the eyes may cause irritation and soreness with possible reversible damage. See section 2 for further details.
Inhalation	May be fatal if swallowed and enters airways.
Eyes	Causes serious eye irritation.
Skin	Causes skin irritation.

Section 5. Fire-fighting measures

5.1. Extinguishing media

Recommended extinguishing media; alcohol resistant foam, CO_2, powder, water spray.
Do not use: water jet.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition: Strong oxidizing agents, acids, bases and material taht react with unsaturated hydrocarbons and alcohols.

Keep away from heat, sparks, open flames, hot surfaces - No smoking.

Keep cool.

5.3. Advice for fire-fighters

Cool closed containers exposed to fire by spraying them with water. Do not allow run off water and contaminants from fire fighting to enter drains or water ways.

ERG Guide No. 129

Section 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Remove sources of ignition, do not turn lights or unprotected electrical equipment on or off. In case of a major spill or spillage in a confined space evacuate the area and check that solvent vapor levels are below the Lower Explosive Limit before re-entering.

6.2. Environmental precautions

Do not allow spills to enter drains or waterways.

Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

6.3. Methods and material for containment and cleaning up

Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Place in a suitable container for disposal in accordance with the waste regulations (see Section 13). Use explosion proof equipment.

Section 7. Handling and storage

7.1. Precautions for safe handling

Handle containers carefully to prevent damage and spillage.

Handle empty containers with care because residual vapors are flammable. Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

See section 2 for further details. - [Prevention]:

7.2. Conditions for safe storage, including any incompatibilities

Keep in original container. Store in a dry, cool, and well-ventilated place. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Ground/bond container and receiving equipment. Use explosion-proof electrical, lighting, ventilating equipment.

Incompatible materials: Strong oxidizing agents, acids, bases and material that react with unsaturated hydrocarbons and alcohols.

See section 2 for further details. - [Storage]:

7.3. Specific end use(s)

No data available.

Section 8. Exposure controls and personal protection

8.1. Control parameters

Exposure

CAS No.	Ingredient	Source	Value
0000067-63-0	Isopropyl Alcohol	OSHA	TWA 400 ppm (980 mg/m3) STEL 500 ppm
		ACGIH	TWA: 200 ppm STEL: 400 ppm
		NIOSH	TWA 400 ppm (980 mg/m3) ST 500 ppm (1225 mg/m3)
0001310-73-2	Sodium hydroxide	OSHA	TWA 2 mg/m3
		ACGIH	Ceiling: 2 mg/m3
		NIOSH	C 2 mg/m3
0008002-09-3	Pine oil	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
0061790-12-3	Tall oil fatty acid	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit

8.2. Exposure controls

Respiratory If workers are exposed to concentrations above the exposure limit they must use the appropriate, certified respirators.

Eyes	Wear safety eyewear, e.g. safety spectacles, goggles or visors to protect against the splash of liquids.
Skin	Overalls which cover the body, arms and legs should be worn. Skin should not be exposed. All parts of the body should be washed after contact.
Engineering Controls	Provide adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and any vapor below occupational exposure limits suitable respiratory protection must be worn.
Other Work Practices	Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

See section 2 for further details.

Section 9. Physical and chemical properties

Appearance	Straw yellow to dark amber, Liquid
Odor	Pine
Odor threshold	Not determined
pH	10.5
Melting point / freezing point	Not Measured
Initial boiling point and boiling range	> 185°C (365°F)
Flash Point	77°C (170°F)
Evaporation rate (Ether = 1)	Not Measured
Flammability (solid, gas)	Not Applicable
Upper/lower flammability or explosive limits	**Lower Explosive Limit:** Not Measured **Upper Explosive Limit:** Not Measured
Vapor pressure (Pa)	Not Measured
Vapor Density	Not Measured
Relative Density	0.945
Solubility in Water	Not Measured
Partition coefficient n-octanol/water (Log Kow)	Not Measured
Auto-ignition temperature	Not Measured
Decomposition temperature	Not Measured
Viscosity (cSt)	Not Measured
VOC Content	VOC (Minus exempt solvents and water) No data available
Maximum Incremental Reactivity	Not Measured
HAPS (lbs/gal)	Not Measured
HAPS (lbs/gal of Solids)	Not Measured
HAPS (lbs/lb of Solids)	Not Measured
% Volatile (by volume)	Not determined

9.2. Other information

No other relevant information.

Section 10. Stability and reactivity

10.1. Reactivity

Hazardous Polymerization will not occur.

10.2. Chemical stability

Flammable liquid and vapor. May form flammable/explosive vapor-air mixture.

10.3. Possibility of hazardous reactions

No data available.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures. Open flame. Ignition sources. Sparks.

10.5. Incompatible materials

Strong oxidizing agents, acids, bases and material that react with unsaturated hydrocarbons and alcohols.

10.6. Hazardous decomposition products

Strong oxidizing agents, acids, bases and material that react with unsaturated hydrocarbons and alcohols.

Section 11. Toxicological information

Acute toxicity

Exposure to solvent vapor concentrations from the component solvents in excess of the stated occupational exposure limits may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on the kidneys, liver and central nervous system. Symptoms include headache, nausea, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness.

Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in dryness, irritation and possible non-allergic contact dermatitis. Solvents may also be absorbed through the skin. Splashes of liquid in the eyes may cause irritation and soreness with possible reversible damage.

Note: When no route specific LD50 data is available for an acute toxin, the converted acute toxicity point estimate was used in the calculation of the product's ATE (Acute Toxicity Estimate).

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation Vapor LC50, mg/L/4hr	Inhalation Dust/Mist LC50, mg/L/4hr	Inhalation Gas LC50, ppm
Pine oil - (8002-09-3)	---	---	---	---	---
Tall oil fatty acid - (61790-12-3)	3,200.00, Rat - Category: 5	---	---	---	---
Isopropyl Alcohol - (67-63-0)	5,840.00, Rat - Category: NA	12,800.00, Rabbit - Category: NA	72.60, Rat - Category: NA	---	---
Sodium hydroxide - (1310-73-2)	325.00, Rabbit - Category: 4	---	---	---	---

Carcinogen Data

CAS No.	Ingredient	Source	Value
0000067-63-0	Isopropyl Alcohol	OSHA	Regulated Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: Yes; Group 4: No;
0001310-73-2	Sodium hydroxide	OSHA	Regulated Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0008002-09-3	Pine oil	OSHA	Regulated Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0061790-12-3	Tall oil fatty acid	OSHA	Regulated Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;

Classification	Category	Hazard Description
Acute toxicity (oral)	---	Not Applicable
Acute toxicity (dermal)	---	Not Applicable
Acute toxicity (inhalation)	---	Not Applicable
Skin corrosion/irritation	2	Causes skin irritation.
Serious eye damage/irritation	2A	Causes serious eye irritation.
Respiratory sensitization	---	Not Applicable
Skin sensitization	---	Not Applicable
Germ cell mutagenicity	---	Not Applicable
Carcinogenicity	---	Not Applicable
Reproductive toxicity	---	Not Applicable
STOT-single exposure	---	Not Applicable
STOT-repeated exposure	---	Not Applicable
Aspiration hazard	1	May be fatal if swallowed and enters airways.

Section 12. Ecological information

12.1. Toxicity

Toxic to aquatic life with long lasting effects.

Aquatic Ecotoxicity

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l

Pine oil - (8002-09-3)	18.35, Oncorhynchus mykiss	24.50, Daphnia magna	Not Available
Tall oil fatty acid - (61790-12-3)	1,000.00, Fish (Piscis)	1,000.00, Daphnia magna	1,000.00 (72 hr), Selenastrum capricornutum
Isopropyl Alcohol - (67-63-0)	10,000.00, Pimephales promelas	Not Available	Not Available
Sodium hydroxide - (1310-73-2)	125.00, Gambusia affinia	40.40, Ceriodaphnia sp.	Not Available

12.2. Persistence and degradability

There is no data available on the preparation itself.

12.3. Bioaccumulative potential

Not Measured

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available.

Section 13. Disposal considerations

13.1. Waste treatment methods

Observe all federal, state and local regulations when disposing of this substance.

Section 14. Transport information

	DOT (Domestic Surface Transportation)	IMO / IMDG (Ocean Transportation)	ICAO/IATA
14.1. UN number	Not Regulated	Not regulated	Not Regulated
14.2. UN proper shipping name			
14.3. Transport hazard class(es)			
14.4. Packing group			
14.5. Environmental hazards			

IMDG Marine Pollutant: Yes; (Pine oil)

14.6. Special precautions for user

Not Applicable

Section 15. Regulatory information

Regulatory Overview The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented.

Toxic Substance Control Act (TSCA) All components of this material are either listed or exempt from listing on the TSCA Inventory.

US EPA Tier II Hazards

Fire: Yes
Sudden Release of Pressure: No
Reactive: No
Immediate (Acute): Yes
Delayed (Chronic): No

EPCRA 302 Extremely Hazardous:
To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

EPCRA 313 Toxic Chemicals:

Isopropyl Alcohol

Section 16. Other information

SDS Revision Date 06/06/2019

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

The full text of the phrases appearing in section 3 is:

H225 Highly flammable liquid and vapor.

H226 Flammable liquid and vapor.

H290 May be corrosive to metals.

H304 May be fatal if swallowed and enters airways.

H314 Causes severe skin burns and eye damage.

H315 Causes skin irritation.

H318 Causes serious eye damage.

H319 Causes serious eye irritation.

H336 May cause drowsiness and dizziness.

H411 Toxic to aquatic life with long lasting effects.

IMPORTANT NOTE: This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party

sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or any process. Final determination of suitability of any material is the sole responsibility of the user.

End of Document

PRO™ CHEMICAL & DYE
126 Shove Street Fall River, MA 02724
1-800-228-9393 www.prochemicalanddye.com

SAFETY DATA SHEET
Soda Ash - Sodium Carbonate

SDS #: 497-19-8
Revision date: 2018-08-28
Format: NA
Version 5.07

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Product Name Soda Ash

Other means of Identification

Synonyms Sodium carbonate, anhydrous; Carbonic acid, disodium salt; Disodium carbonate

Chemical Family Alkali salt

Recommended use of the chemical and restrictions on use

Recommended Use: Glass manufacture, Personal care, Detergent. Water treatment chemical. Chemical processing

Restrictions on Use: See section 16 for more information

Supplier Address

PRO Chemical & Dye
126 Shove Street
Fall River, MA 02724

Emergency telephone number

800-255-3924 ChemTel.
(United States)
+ 1 01 813-248-0585
(Outside the United States)

2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Serious eye damage/eye irritation

Category 2

GHS Label elements, including precautionary statements

EMERGENCY OVERVIEW

Warning

Hazard Statements

H319 - Causes serious eye irritation

Precautionary Statements - Prevention

P264 - Wash face, hands and any exposed skin thoroughly after handling
P280 - Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements· Response

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337 + P313 - If eye irritation persists: Get medical advice/ attention

Hazards not otherwise classified (HNOC)

No hazards not otherwise classified were identified.

Other Information

May be harmful if swallowed,
Prolonged or repeated contact may dry skin and cause irritation

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Family Alkali salt.
Formula Na2C03

Chemical name	CAS-No	Weight%
Sodium carbonate	497-19-8	*100*

Synonyms are provided in Section 1.

4. FIRST AID MEASURES

Eye Contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If symptoms persist, call a physician.

Skin Contact

Wash off with warm water and soap. Get medical attention if irritation develops and persists. Remove and wash contaminated clothing before re-use.

Inhalation

Remove person to fresh air. If signs/symptoms continue, get medical attention.

Ingestion	Never give anything by mouth to an unconscious person Get medical attention if symptoms occur
Most important symptoms and effects, both acute and delayed	Causes serious eye damage / eye irritation.
Indication of immediate medical attention and special treatment needed, if necessary	Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Use extinguishing agent suitable for type of surrounding fire.
Specific Hazards Arising from the Chemical	Non-combustible, substance itself does not bum but may decompose upon heating to produce corrosive and/or toxic fumes
Hazardous Combustion Products	Fumes of sodium oxide. Carbon oxides (COx).
Explosion data Sensitivity to Mechanical Impact Sensitivity to Static Discharge	 Not sensitive. Not sensitive.
Protective equipment and precautions for firefighters	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Avoid dust formation. Sweep up to prevent slipping hazard.
Other	For further clean-up instructions, call Emergency Hotline number listed in Section 1 "Product and Company Identification" above.
Environmental Precautions	Do not flush into surface water or sanitary sewer system.
Methods for Containment	Prevent large quantities of this product from contacting vegetation or waterways. Cover with plastic sheet to prevent spreading. Pick up and transfer to properly labeled containers. Keep in suitable and closed containers for disposal.
Methods for cleaning up	Pick up and transfer to properly labeled containers. Keep in suitable and closed containers for disposal. Dispose of waste as indicated in Section 13.

7. HANDLING AND STORAGE

Handling	Use air conveying/mechanical systems for bulk transfer to storage. Provide appropriate exhaust ventilation at places where dust is formed. In case of insufficient ventilation, wear suitable respiratory equipment if release of airborne dust is expected. Make sure the locations of the *eye* washers and safety showers are close to the workstation locations.
Storage	Store in original container. Keep in properly labeled containers. Keep container tightly closed.
Incompatible products	Aluminum. Powdered aluminum. Acids

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies Local nuisance dust standards apply

Appropriate engineering controls

Engineering measures	Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction.

Individual protection measures, such as personal protective equipment

Eye/Face Protection	Tightly fitting safety goggles.
Skin and Body Protection	Wear suitable protective clothing. Protective shoes or boots.
Hand Protection	Nitrile rubber, Neoprene gloves
Respiratory Protection	In case of inadequate ventilation wear respiratory protection.
Hygiene measures	Handle in accordance with good industrial hygiene and safety practice. Make sure the locations of the eye washers and safety showers are close to the workstation locations.
General information	These recommendations apply to the product as supplied

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Granules
Physical State	Solid
Color	White
Odor	odorless
Odor threshold	Not applicable
pH	11.4 (1% solution in water)
Melting point/freezing point	851 °C
Boiling Point/Range	No information available
Flash point	Not applicable
Evaporation Rate	No information available
Flammability (solid, gas)	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes
Flammability Limit in Air	
Upper flammability limit:	No information available
Lower flammability limit:	No information available
Vapor pressure	No information available
Vapor density	No information available
Density	No information available
Specific gravity	2.52
Water solubility	212.5 g/L @ 20°C
Solubility in other solvents	No information available
Partition coefficient	No information available
Auto-ignition temperature	No information available
Decomposition temperature	400°C
Viscosity, kinematic	No information available
Viscosity, dynamic	No information available
Explosive properties	Not explosive
Oxidizing properties	Non-oxidizing
Molecular weight	105.99
Bulk density	0.86 - 1.12 g/cm3 (Dense grades) 0.70 - 0.90 g/cm3 (Light Grades)
Kst	0 bar *m/s*

10. STABILITY AND REACTIVITY

Reactivity	None under normal use conditions.

Chemical Stability	Stable. Decomposes by reaction with strong acid.
Possibility of Hazardous Reactions	None under normal processing.
Hazardous polymerization	Hazardous polymerization does not occur.
Conditions to avoid	Exposure to air or moisture over prolonged periods.
Incompatible materials	Aluminum. Powdered aluminum. Acids.
Hazardous Decomposition Products	Sodium oxides. Carbon oxides (COx).

11. TOXICOLOGICAL INFORMATION

Product Information

LD50 Oral	2,800 mg/kg (rat)
L050 Dermal	> 2,000 mg/kg (rabbit)
LC50 Inhalation	
Eye Contact	Irritating to eyes.
Skin Contact	Non-irritating
Sensitization	Patch test on human volunteers did not demonstrate sensitization properties.

Information on toxicological effects

Symptoms	No information available.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic toxicity	No known effect.
Mutagenicity	No information available
Carcinogenicity	Not recognized as carcinogenic by Research Agencies (IARC, NTP, OSHA, ACGIH).
Reproductive toxicity	No information available.
STOT - single exposure	No information available.
STOT - repeated exposure	No information available.
Aspiration hazard	No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Sodium carbonate (497-19-8)				
Active Ingredient(s)	Duration	Species	Value	Units
Sodium Carbonate	196 h LC50	Bluegill sunfish	1300	mg/l
Sodium Carbonate	148 h EC50	*Ceriodaphnia*	1200-227	mg/l

Persistence and degradability	Biodegradability does not pertain to inorganic substances.
Bioaccumulation	Does not bio-accumulate.
Mobility	Dissociates into ions.
Other Adverse Effects	None known.

13. DISPOSAL CONSIDERATIONS

Waste disposal methods	This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). Dispose of in accordance with local regulations.
Contaminated Packaging	Dispose of in accordance with local regulations.

14. TRANSPORTATION INFORMATION

DOT	NOT REGULATED
TDG	NOT REGULATED
ICAO/IATA	NOT REGULATED
IMDG/IMO	NOT REGULATED

U.S. Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA *311/312* Hazard Categories

Acute health hazard	Yes
Chronic health hazard	No
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

Clean Water Act

This product does not contain any Substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCIA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

US State Regulations

California Proposition 65

WARNING: *This product can expose you to chemicals including lead, which are known to the State of California* to *cause cancer and birth defects or other reproductive harm. For more information go to* www.P65Warnings.ca.gov

U.S. State Right-to~Know Regulations

This product Is not listed on state right-to-know regulations

International Inventories

Component	TSCA (United States)	DSI (Canada)	EINECS/ELINCS (Europe)	ENCS (Japan)	China (IECSC)	KECI (Korea)	PfCCS (Philippines)	AICS (Australia)
Sodium carbonate 497-19-8 (100)	X	X	X	X	X	X	X	X

Mexico - Grade: Moderate risk, Grade 2

16. OTHER INFORMATION

NFPA	Health Hazards 2	Flammability 0	Instability 0	Special Hazards -

HMIS Health Hazards 2 Flammability0 Physical hazard 0 Personal Protection X
NFPA/HMIS Ratings Legend Severe= 4; Serious= 3; Moderate= 2; Slight - 1; Minimal = 0

Product Certifications

This product is certified to NSF/ANSI Standard 60 for use in drinking water treatment at the specified maximum use limit. The MUL (maximum [illegible] for sodium carbonate, anhydrous is *150 mg/L* under NSF/ANSI Standard 60.

NSFJANSI60

Halal: IFANCA

American Water Works Association

Revision date: 2018-08-28
Revision note Updated for Prop 65

Disclaimer
This company believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. The Information provided herein relates only to the specified product designated and may not be applicable where such product is used in combination with any other materials or in any process. Further, since the conditions and methods of use are beyond the control of this company, this company expressly disclaims any and all liability as to any results obtained or arising from any use of the products or reliance on such information.

End of Safety Data Sheet

Pyrethrin Concentrate
Safety Data Sheet

1. IDENTIFICATION

Product identifier	Pyrethrin Concentrate
Other means of identification	EPA Reg. No. 89459-29-829
Synonyms	None
Recommended use	Insecticide
Uses advised against	KEEP OUT OF THE REACH OF CHILDREN. Avoid contact with eyes, skin and clothing. Do not use or store near heat or open flame. Avoid release to the environment. Do not take internally. Avoid inhalation of vapors or fumes.
Company	Southern Agricultural Insecticides, Inc. P.O. Box 218 Palmetto, FL 34220
Company Telephone/Fax	(941) 722-3285/(941) 723-2974
Emergency Telephone Number	For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, Call CHEMTREC Day or Night: 1-800-424-9300 Recommended use

2. HAZARD IDENTIFICATION

United States (US)
According to: OSHA 29 CFR 1910.1200 HCS

Classification of the substance or mixture

OSHA HCS 2012
Aspiration 1
Flammable Liquids 4
Skin Irritation 2
Skin Sensitization 1
Specific Target Organ Toxicity Single Exposure 3: Narcotic Effects Serious Eye Damage 1

Label elements

Signal word DANGER

Hazard statements
Causes skin irritation
May be fatal if swallowed and enters airways
May cause an allergic skin reaction
Combustible liquid
May cause drowsiness or dizziness
Causes serious eye damage

Precautionary statements

Prevention
Wash thoroughly after handling.
Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves/protective clothing/eye protection/face protection. Avoid breathing dust, fume, gas, mist, vapors and/or spray.
Keep away from heat, sparks, open flames and/or hot surfaces. - No smoking. Use only out doors or in a well-ventilated area.

Response
IF ON SKIN: Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/ attention. Take off contaminated clothing and wash before reuse.
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do NOT induce vomiting. In case of fire: Use appropriate media CO2, foam, dry chemical or sand for extinction.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a poison control center or doctor if you feel unwell.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

Storage/Disposal Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.
Store in a well-ventilated place. Keep cool. Store locked up.
Store in a well-ventilated place. Keep container tightly closed.
Keep cool.

Other hazards
OSHA HCS 2012

This product is highly toxic to bees exposed to direct treatment on blooming crops or weeds. This product is toxic to aquatic organisms including fish and invertebrates. Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances Material does not meet the criteria of a substance.

Mixtures

	Composition	
Chemical Name	**Identifiers**	**%**
Pyrethrins	CAS:8003-34-7	0.96%
Piperonyl butoxide	CAS:51-03-6	9.60%
Distillates (petroleum), hydrotreated light	CAS:64742-47-8	81.44%
Nonylphenol, ethoxylated	Proprietary	8.00%

4. FIRST-AID MEASURES

Description of first aid measures

Inhalation IF INHALED: If breathing is difficult, remove person to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

Skin IF ON SKIN: Wash with plenty of soap and water. If irritation or rash occurs, get medical advice/attention. Take off contaminated clothing and wash before reuse.

Eye IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CONTROL center or doctor.

Ingestion IF SWALLOWED: Immediately call a poison control center or doctor. Aspiration hazard - if swallowed, do NOT induce vomiting.

Most important symptoms and effects, both acute and delayed

Aspiration hazard, causes serious eye damage, causes skin irritation, may cause an allergic skin reaction in individuals with a sensitivity to piperonyl butoxide, may cause dizziness and/or drowsiness if inhaled. Refer to Section 11 - Toxicological Information.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Contains petroleum distillate vomiting may cause aspiration pneumonia. Treat symptomatically and supportively.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable Extinguishing Media LARGE FIRE: Water spray, fog or regular foam.
SMALL FIRES: Dry chemical, CO2, sand or regular foam.

Unsuitable Extinguishing Media	**Avoid heavy hose streams.**
Firefighting Procedures	Do not allow fire fighting water to escape into waterways or sewers. LARGE FIRES: Dike fire control water for later disposal; do not scatter the material. LARGE FIRES: Move containers from fire area if you can do it without risk. Stay upwind. Ventilate closed spaces before entering. Do not breathe gas/fumes/vapor/spray.

Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards	Combustible liquid. Containers may explode when heated. Liquid will float and may re-ignite on surface of water.
Hazardous Combustion Products	Combustible liquid - may produce carbon dioxide and/or carbon monoxide.
Advice for firefighters	Wear positive pressure self-contained breathing apparatus (SCBA).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions	Do not walk through spilled material. Ventilate enclosed areas. Wear appropriate personal protective equipment, avoid direct contact.
Emergency Procedures	ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Ventilate closed spaces before entering. Avoid release into the environment.
Environmental precautions	LARGE SPILLS: Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up

Containment/Clean-up Measures	Absorb spills with an inert material, clay granules or other inert absorbent material and put in container for disposal. All equipment used when handling the product must be grounded. LARGE SPILLS: Dike far ahead of spill for later disposal. Stop leak if you can do it without risk.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling	Keep away from fire - No Smoking. Avoid breathing fumes. Use only in well ventilated areas. Wear appropriate personal protective equipment, avoid direct contact.

Conditions for safe storage, including any incompatibilities

Storage	Store locked up. Store in a cool/low-temperature, well-ventilated dry place away from heat and ignition sources. Keep from freezing. Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F
Incompatible Materials or Ignition Sources	Heat, sparks, open flame.
Other Information	See product label for additional information.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Limits/Guidelines	No data available.

		Exposure Limits/Guidelines		
	Result	ACGIH	NIOSH	OSHA
Pyrethrins (8003-34-7)	TWAs	5 mg/m3 TWA	5 mg/m3 TWA	5 mg/m3 TWA

Exposure Limits Supplemental

ACGIH

•Pyrethrins (8003-34-7): TLV Basis - Critical Effects: (liver damage; lower respiratory tract irritation)

Engineering Measures/Controls Use adequate ventilation to remove vapors (fumes, dust, etc.)

Personal Protective Equipment

Pictograms

Respiratory In case of insufficient ventilation, wear suitable respiratory equipment. Not required with normal use. How ever, mixers, loaders, applicators and other handlers must wear respiratory protection with P or R filters.

Eye/Face Wear chemical splash safety goggles.

Hands Wear appropriate gloves.

Skin/Body If prolonged exposure is anticipated, it is recommended for handlers to wear appropriate clothing to prevent skin contact.

Environmental Exposure Controls Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

Other Information See product label for specific use PPE instructions.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on Physical and Chemical Properties

Material Description			
Physical Form	Liquid	Appearance/Description	Yellow to amber liquid.
Color	Yellow to amber.	Odor	Pleasant woodsy.
Odor Threshold	No data available		
General Properties			
Boiling Point	No data available	Melting Point/Freezing Point	No data available
Decomposition Temperature	No data available	pH	No data available
Specific Gravity/Relative Density	6.8 lb/gal (0.82 g/ml)	Density	No data available
Water Solubility	insoluble	Viscosity	No data available
Critical Temperature	No data available		
Volatility			
Vapor Pressure	No data available	Vapor Density	No data available
Evaporation Rate	No data available		
Flammability			
Flash Point	152 F(66.6667 C) CC (Closed Cup)	UEL	7.0 (solvent)
LEL	0.6 (solvent)	Autoignition	No data available
Flammability (solid, gas)	No data available		
Environmental			
Octanol/Water Partition coefficient	No data available		

10. STABILITY AND REACTIVITY

Reactivity	Non-reactive under normal handling and storage conditions.
Chemical stability	Stable
Possibility of hazardous reactions	Hazardous polymerization will not occur.
Conditions to avoid	Direct sunlight. Do not freeze. Excessive heat >110°F. Heat, sparks, open flame, other ignition sources, and oxidizing conditions.
Incompatible materials	Store away from oxidizers.
Hazardous decomposition products	Carbon dioxide and possibly carbon monoxide.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Components	
Pyrethrins (0.96%) 8003-34-7	**Acute Toxicity:** Ingestion/Oral-Rat, adult female LD50 • 1030 mg/kg; Ingestion/Oral-Rat, adult male LD50 • 2370 mg/kg; Inhalation-Rat LC50 • 3.4 mg/L; Skin-Rat LD50 • 2000 mg/kg
Piperonyl butoxide (9.6%)	**Acute Toxicity:** Ingestion/Oral-Rat • 4300 mg/kg; Inhalation-Rat • >5 mg/L 4 **Irritation:** Eye-Rabbit • Essentially non-irritating; Skin-Rabbit • Essentially non-irritating

GHS Properties	**Classification**
Respiratory sensitization	OSHA HCS 2012 • Classification criteria not met
Serious eye damage/Irritation	OSHA HCS 2012 • Serious Eye Damage 1
Acute toxicity	OSHA HCS 2012 • Acute Toxicity - Dermal - Classification criteria not met; Acute Toxicity Inhalation - Classification criteria not met; Acute Toxicity - Oral - Classification criteria not met
\Aspiration Hazard	OSHA HCS 2012 • Aspiration 1
Carcinogenicity	OSHA HCS 2012 • Classification criteria not met
Skin corrosion/Irritation	OSHA HCS 2012 • Skin Irritation 2
Skin sensitization	OSHA HCS 2012 • Skin Sensitizer 1
STOT-RE	OSHA HCS 2012 • Classification criteria not met
STOT-SE	OSHA HCS 2012 • Specific Target Organ Toxicity Single Exposure 3: Narcotic Effects
Toxicity for Reproduction	OSHA HCS 2012 • Classification criteria not met
Germ Cell Mutagenicity	OSHA HCS 2012 • Not classified - data lacking

Potential Health Effects

Inhalation	
Acute (Immediate)	May cause drowsiness and dizziness.
Chronic (Delayed)	No data available
Skin	
Acute (Immediate)	•May cause an allergic reaction in individuals with a sensitivity to piperonyl butoxide. Causes skin irritation.
Chronic (Delayed)	No data available
Eye	
Acute (Immediate)	Causes serious eye damage.
Chronic (Delayed)	No data available
Ingestion	
Acute (Immediate)	Aspiration hazard - small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

Chronic (Delayed) No data available

Mutagenic Effects Piperonyl butoxide was not genotoxic in several tests, including the Ames mutagenicity assay, chromosome aberration in Chinese hamster ovary (CHO) cells, CHO/HGPRT assay with S9 activation and in the unscheduled DNA synthesis (UDS) assay in cultured human liver cells. Pyrethrins were not found to be genotoxic and did not damage DNA in any study conducted which included: Ames assay, chromosome aberration in Chinese hamster ovaries (CHO) cells and in the unscheduled DNA synthesis (UNS) assay in cultured human liver cells.

Carcinogenic Effects Piperonyl butoxide is not classified as carcinogen by NTP, IARC and OSHA. Pyrethrins are not listed as a carcinogen by OSHA, IARC, or NTP.

Reproductive Effects Pyrethrins did not produce any birth defects or adverse effects on reproductive parameters in tests with rats and rabbits.

12. ECOLOGICAL INFORMATION

Toxicity

Components		
Pyrethrins (0.96%)	8003-34-7	**Aquatic Toxicity-Fish:** 96 Hour(s) LC50 Rainbow trout 0.0051 mg/L [Acute] 96 Hour(s) LC50 Sheepshead minnow 0.016 mg/L [Acute] 96 Hour(s) NOEC Fathead minnow 0.0019 mg/L [Chronic] NOEC Sheepshead minnow 0.0059 mg/L [estimated chronic] **Aquatic Toxicity-Crustacea:** NOEC Daphnia magna 0.00086 mg/L [Chronic] NOEC Mysid shrimp 0.0001 mg/L [Estimated chronic] 96 Hour(s) LC50 Mysid Shrimp 0.0014 mg/L [Acute] 48 Hour(s) LC50 Water Flea Daphnia magna 0.0116 mg/L [Acute]
Distillates (petroleum), hydrotreated light (81.44%)	64742-47-8	Aquatic Toxicity-Fish: 96 Hour(s) LC50 Rainbow Trout 2.9 mg/L [Acute] 96 Hour(s) LC50 Lepomis macrochirus 2.2 mg/L [Acute]

Persistence and degradability Pyrethrins have low persistence in the environment due to rapid breakdown in presence of UV light.

Bioaccumulative potential No data available.

Mobility in Soil Pyrethrins are relatively immobile in soil.

Other adverse effects

Potential Environmental Effects This product is toxic to aquatic organisms, including fish and invertebrates. This product is highly toxic to bees exposed to direct treatment. Care should be taken to avoid contamination of the environment.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Product waste Dispose of content and/or container in accordance with local, regional, national, and/or international regulations. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Do not contaminate water by disposal.

Packaging waste Dispose of content and/or container in accordance with local, regional, national, and/or international regulations. See product label for disposal instructions.

14. TRANSPORTATION INFORMATION

	UN number	UN proper shipping name	Transport hazard class(es)	Packing group	Environmental hazards
DOT	None	Not regulated (for packages <104 lbs.)	None	None	Not Applicable
IMO/IMDG	UN3082	Environmentally Hazardous Substance, Liquid (Pyrethrins, piperonyl butoxide)	9	III	Marine Pollutant
IATA/ICAO	UN3082	Environmentally Hazardous Substance, Liquid (Pyrethrins, piperonyl butoxide)	9	III	Acute Aquatic Toxicity

Special precautions for user None specified.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code No data available

Other information	DOT	Environmental Hazards: RQ (Pyrethrins = 1 lb).
	IMO/IMDG	No data available
	IATA/ICAO	No data available

15. REGULATORY INFORMATION

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

SARA Hazard Classifications SARA Title III Section 313, Acute

FIFRA – Pesticide Labeling This chemical is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non- pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions for use.

CAUTION

Precautionary Statements KEEP OUT OF THE REACH OF CHILDREN.

Hazards to Humans and Domestic Animals

Contains Petroleum Distillate. Harmful if absorbed through the skin. Avoid contact with skin, eyes or clothing. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet.

First Aid

If on skin or clothing • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 1 5-20 minutes. • Call a Poison Control Center or doctor for treatment advice. If swallowed • Immediately call a Poison Control Center or doctor. • Do not induce vomiting unless told to do so by the Poison Control Center or doctor. • Do not give any liquid to the person. • Do not give anything by mouth to an unconscious person.
NOTE TO PHYSICIAN: Contains petroleum distillate - vomiting may cause aspiration pneumonia.

Environmental Hazards

For Terrestrial Applications: This product is toxic to aquatic organisms, including fish and invertebrates. Drift and runoff may be hazardous to aquatic organisms in water adjacent to treated areas. This product may contaminate water through runoff. This product has a potential for runoff for several weeks after application. Poorly draining soils and soils with shallow water tables are more prone to produce runoff that contains this product. This product is highly toxic to bees exposed to direct treatment on blooming crops or weeds.
Do not apply this product or allow it to drift to blooming crops or weeds while bees are actively visiting the treatment area. Except as specified in the directions for use, do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash-water or rinsate. For Wide Area Mosquito Adulticide Applications: This pesticide is toxic to aquatic organisms, including fish and invertebrates. Runoff from treated areas or deposition of spray droplets into a body of water may be hazardous to fish and aquatic invertebrates.
When applying as a wide area mosquito adulticide, before making the first application in a season, it is advisable to consult with the state or tribal

agency with primary responsibility for pesticide regulation to determine if highly toxic to bees exposed to direct treatment on blooming crops or weeds.
Do not apply when bees health determined by a state, tribal, or local health or vector control agency on the basis of documented evidence of disease causing agents in vector mosquitoes or the occurrence of mosquito-borne disease in animal or human populations, or if specifically approved by the state or tribe during a natural disaster recovery effort. When applying as a wide area mosquito adulticide, do not apply over bodies of water (lakes, rivers, permanent streams, natural ponds, commercial fish ponds, swamps, marshes or estuaries), except when necessary to target areas where adult mosquitoes are present, and weather conditions will facilitate movement of applied material away from the water in order to minimize incidental deposition into the water body. (For contain ers equal to or greater than 5 gallons} Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

		Inventory
Component	**CAS**	**TSCA**
Distillates (petroleum), hydrotreated light	64742-47-8	Yes
Nonylphenol, ethoxylated	Proprietary	Yes
Piperonyl butoxide	51-03-6	Yes
Pyrethrins	8003-34-7	No

Environment

U.S. - CERCLA/SARA - hazardous Substances and their Repportable Quantities

Nonylphenol, ethoxylated	Proprietary	Not Listed
Pyrethrins	8003-34-7	1 lb final RQ (listed under (listed under Pyrethrins)
Distillates (petroleum), hydrotreated light	64742-47-8	Not Listed
Piperonyl butoxide	51-03-6	Not Listed

U.S. - CERCLA/SARA Section 313 Emission Reporting

Nonylphenol, ethoxylated	Proprietary	Not Listed
Pyrethrins	8003-34-7	Not Listed
Distillates (petroleum), hydrotreated light	64742-47-8	Not Listed
Piperonyl butoxide	51-03-6	1.0 % de minimis concentration

Disclaimer/Statement of Liability

The information and statements herein are believed to be reliable but are not to be construed as a warranty or representation for which we assume legal responsibility. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information or products referred to herein. NO WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS MADE.

June, 2016

SDS: 0004245
Date Prepared: 03/04/2014

SAFETY DATA SHEET

1. IDENTIFICATION

Product Name:	**AERO® 5688 Promoter**
Synonyms:	None
Chemical Family:	Monothiophosphate
Molecular Formula:	Mixture
Molecular Weight:	Mixture
Intended/Recommended Use:	Mining chemical

CYTEC INDUSTRIES INC., FIVE GARRET MOUNTAIN PLAZA, WOODLAND PARK, NEW JERSEY 07424, USA
For Product and all Non-Emergency Information call 1-800/652-6013. Outside the USA and Canada call 1-973/357-3193.

EMERGENCY PHONE (24 hours/day) - For emergency only involving spill, leak, fire, exposure or accident call:
Asia Pacific:
Australia - +61-3-9663-2130 or 1800-033-111
China (PRC) - +86 0532 83889090 (NRCC)
New Guinea - +61-3-9663-2130
New Zealand - +61-3-9663-2130 or 0800-734-607
All Others - +65 3158 1074 (Carechem24 Singapore)
Canada: +1-905-356-8310 (Cytec Welland, Canada plant)
Europe/Africa/Middle East (Carechem24 UK):
Europe, Middle East, Africa, Israel - +44 (0) 1235 239 670
Middle East, Africa (Arabic speaking countries) - +44 (0) 1235 239 671
Latin America:
Brazil - 0800 7077 022 (SUATRANS)
Chile - +56-2-247-3600 (CITUC QUIMICO)
All Others - +52-376-73 74122 (Cytec Atequiza, Mexico plant)
USA: +1-703-527-3887 or 1-800-424-9300 (CHEMTREC #CCN6083)

2. HAZARDS IDENTIFICATION

GHS Classification
Skin Corrosion / Irritation Hazard Category 1B
Serious Eye Damage / Eye Irritation Hazard Category 1

LABEL ELEMENTS

Signal Word
Danger

Hazard Statements
Causes severe skin burns and eye damage

Precautionary Statements
Do not breathe dust/fume/gas/mist/vapours/spray.
Wash face, hands and any exposed skin thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
Wash contaminated clothing before reuse.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Immediately call a POISON CENTER or doctor/physician.
Specific treatment (see supplemental first aid instructions on this label).
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Store locked up.
Dispose of contents/container in accordance with local and national regulations.

Hazards Not Otherwise Classified (HNOC), Other Hazards
Contact with acids liberates toxic gas.

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3. COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS

Component / CAS No.	%	GHS Classification	Carcinogen
Monothiophosphates -	30 - 60	Skin Corr. 1B (H314) Eye Dam. 1 (H318)	-
Sodium hydroxide 1310-73-2	0.5	Met. Corr. 1 (H290) Skin Corr. 1A (H314) Eye Dam. 1 (H318)	-

The specific chemical identity and/or exact percentage of composition for one or more ingredients has been withheld as a trade secret.

Additional GHS classification or other information may be included in this section but has not been adopted by OSHA. See Section 16 for full text of H phrases.

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4. FIRST AID MEASURES

DESCRIPTION OF FIRST AID MEASURES

Eye Contact:
Rinse immediately with plenty of water for at least 15 minutes. Obtain medical attention immediately.

Skin Contact:
Remove contaminated clothing and shoes without delay. Wear impermeable gloves. Wash immediately with plenty of water and soap. Pay particular attention to skin crevices, nail folds, etc. Do not reuse contaminated clothing without laundering. Do not reuse contaminated leatherware. Obtain medical attention.

Ingestion:
If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

Inhalation:
Remove to fresh air. If breathing is difficult, give oxygen. Apply artificial respiration if patient is not breathing. Obtain medical attention immediately.

MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED

None known

INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDS

Not applicable

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5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media:
Use water spray or fog, carbon dioxide or dry chemical.

Protective Equipment:
Firefighters, and others exposed, wear self-contained breathing apparatus. Wear full firefighting protective clothing. See MSDS Section 8 (Exposure Controls/Personal Protection).

Special Hazards:
Sulfur dioxide or hydrogen sulfide may be formed under fire conditions. Do not flush to sewer which may contain acid. This could result in generation of toxic and flammable hydrogen sulfide.

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6. ACCIDENTAL RELEASE MEASURES

Personal precautions:
Where exposure level is not known, wear approved, positive pressure, self-contained respirator. Where exposure level is known, wear approved respirator suitable for level of exposure. In addition to the protective clothing/equipment in Section 8, wear a two piece PVC suit with hood or PVC overalls with hood.

Methods For Cleaning Up:
Cover spills with some inert absorbent. Sweep up into containers for disposal. Flush spill area with water.

References to other sections:
See Sections 8 and 13 for additional information.

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7. HANDLING AND STORAGE

HANDLING

Precautions: Wash hands thoroughly after handling. Wear protective gloves/clothing and eye/face protection.

Special Handling Statements: This product should not be mixed with acids since evolution of toxic and explosive hydrogen sulfide gas could result. This precaution does not, of course, apply to addition of this reagent to flotation pulps in amounts customarily used in flotation.

STORAGE
Store in accordance with local, state, and federal regulations.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Measures:
Utilize a closed system process where feasible. Where this material is not used in a closed system, good enclosure and local exhaust ventilation should be provided to control exposure.

Respiratory Protection:
Where exposures are below the established exposure limit, no respiratory protection is required. Where exposures exceed the established exposure limit, use respiratory protection recommended for the material and level of exposure.

Eye Protection:
Prevent eye and skin contact. Provide eye wash fountain and safety shower in close proximity to points of potential exposure. Wear eye/face protection such as chemical splash proof goggles or face shield.

Skin Protection:
Prevent contamination of skin or clothing when removing protective equipment. Wear impermeable gloves and suitable protective clothing.

Hand Protection:
Wear impermeable gloves. Replace gloves immediately when torn or any change in appearance (dimension, colour, flexibility etc) is noticed. Barrier creams may help to protect the exposed areas of the skin, they should however not be applied once exposure has occurred.

Additional Advice:
Food, beverages, and tobacco products should not be carried, stored, or consumed where this material is in use. Before eating, drinking, or smoking, wash face and hands thoroughly with soap and water.

Exposure Limit(s)

1310-73-2 Sodium hydroxide

OSHA (PEL):	2 mg/m^3 (TWA)
ACGIH (TLV):	2 mg/m^3 (Ceiling)
Other Value:	Not established

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9. PHYSICAL AND CHEMICAL PROPERTIES

Color:	brown		
Appearance:	liquid		
Odor:	sulfur		
Boiling Point:	Not available		
Melting Point:	Not available		
Vapor Pressure:	Not available		
Specific Gravity/Density:	1.20 @ 25 °C		
Vapor Density:	Not available		
Percent Volatile (% by wt.):	45 - 50		
pH:	12.0 - 13.0		
Saturation In Air (% By Vol.):	Not available		
Evaporation Rate:	Not available		
Solubility In Water:	Complete		
Volatile Organic Content:	Not available		
Flash Point:	>96 °C	205 °F	Pensky-Martens Closed Cup
Flammable Limits (% By Vol):	Not available		
Autoignition (Self) Temperature:	Not available		
Decomposition Temperature:	Not available		
Partition coefficient (n-octanol/water):	Not available		
Odor Threshold:	Not available		
Viscosity (Kinematic):	Not applicable		

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10. STABILITY AND REACTIVITY

Stability:	Stable
Conditions To Avoid:	None known
Polymerization:	Will not occur

Conditions To Avoid:	None known
Materials To Avoid:	Strong acids and strong oxidizing agents.
Hazardous Decomposition Products:	Carbon monoxide (CO) Carbon dioxide oxides of sulfur (includes sulfur di and tri oxides) phosphorus hydrogen sulfide (H2S)

11. TOXICOLOGICAL INFORMATION

PRODUCT TOXICITY INFORMATION

Likely Routes of Exposure: Eyes, Skin.

ACUTE TOXICITY DATA

oral	rat	Acute LD50	>2000 mg/kg
dermal	rabbit	Acute LD50	>2000 mg/kg
inhalation	rat	Acute LC50 4 hr	>5 mg/l

LOCAL EFFECTS ON SKIN AND EYE

Acute Irritation	dermal	Corrosive
Acute Irritation	eye	Causes serious damage

ALLERGIC SENSITIZATION

Sensitization	dermal	Not sensitizing
Sensitization	inhalation	Not sensitizing

GENOTOXICITY

Assays for Gene Mutations

Ames Salmonella Assay	No data

OTHER INFORMATION

The product toxicity information above has been estimated.

HAZARDOUS INGREDIENT TOXICITY DATA

Sodium hydroxide (NaOH) is corrosive to eyes, skin, and soft tissues of the digestive and respiratory tracts. Even dilute solutions of NaOH can produce irreversible damage to eyes and skin. Acute overexposure to NaOH mists or dusts causes severe respiratory irritation. NaOH is not a known skin or respiratory sensitizer. Reported acute oral (rat) and dermal (rabbit) LD50 values are 104-340 mg/kg and 1250 mg/kg, respectively. Fatal ingestion and fatal dermal exposure has been reported for humans. According to the OECD (2002), no valid animal data are available on repeated dose toxicity by the oral, dermal or inhalation routes. However, under normal, non-irritating handling and use conditions, exposure to NaOH is not expected to result in systemic availability and, therefore, harmful effects are not anticipated. NaOH is not known to cause reproductive or developmental toxicity. Both in vitro and in vivo genetic toxicity tests with NaOH indicated no evidence for mutagenic activity.

12. ECOLOGICAL INFORMATION

TOXICITY, PERSISTENCE AND DEGRADABILITY, BIOACCUMULATIVE POTENTIAL, MOBILITY IN SOIL, OTHER ADVERSE EFFECTS

This material is not classified as dangerous for the environment.

FISH TEST RESULTS

Test: Acute toxicity, freshwater (OECD 203)
Duration: 96 hr.
Species: Rainbow Trout (Oncorhyncus mykiss)
47.0 mg/l LC50
Test: Acute toxicity, freshwater (OECD 203)
Duration: 96 hr
Species: Fathead Minnow (Pimephales promelas)
120 mg/l LC50

INVERTEBRATE TEST RESULTS

Test: Acute Immobilization (OECD 202)
Duration: 48 hr
Species: Water Flea (Daphnia magna)
47.0 mg/l EC50

DEGRADATION

Test: Biodegradability
>70 % Information based on a structurally and compositionally similar material

RESULTS OF PBT AND vPvB ASSESSMENT
Not determined

HAZARDOUS INGREDIENT TOXICITY DATA

Component / CAS No.	Toxicity to Algae	Toxicity to Fish	Toxicity to Water Flea
Monothiophosphates -	Not available	Not available	Not available
Sodium hydroxide 1310-73-2	Not available	LC50 = 45.4 mg/L - Oncorhynchus mykiss (96h)	Not available

13. DISPOSAL CONSIDERATIONS

13. DISPOSAL CONSIDERATIONS

The information on RCRA waste classification and disposal methodology provided below applies only to the product, as supplied. If the material has been altered or contaminated, or it has exceeded its recommended shelf life, the guidance may be inapplicable. Hazardous waste classification under federal regulations (40 CFR Part 261 et seq) is dependent upon whether a material is a RCRA "listed hazardous waste" or has any of the four RCRA "hazardous waste characteristics." Refer to 40 CFR Part 261.33 to determine if a given material to be disposed of is a RCRA "listed hazardous waste"; information contained in Section 15 of this MSDS is not intended to indicate if the product is a "listed hazardous waste." RCRA Hazardous Waste Characteristics: There are four characteristics defined in 40 CFR Section 261.21-61.24: Ignitability, Corrosivity, Reactivity, and Toxicity. To determine Ignitability, see Section 9 of this MSDS (flash point). For Corrosivity, see Sections 9 and 14 (pH and DOT corrosivity). For Reactivity, see Section 10 (incompatible materials). For Toxicity, see Section 3 (composition). Federal regulations are subject to change. State and local requirements, which may differ from or be more stringent than the federal regulations, may also apply to the classification of the material if it is to be disposed. The Company encourages the recycle, recovery and reuse of materials, where permitted, as an alternate to disposal as a waste. The Company recommends that organic materials classified as RCRA hazardous wastes be disposed of by thermal treatment or incineration at EPA approved facilities. The Company has provided the foregoing for information only; the person generating the waste is responsible for determining the waste classification and disposal method.

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14. TRANSPORT INFORMATION

This section provides basic shipping classification information. Refer to appropriate transportation regulations for specific requirements.

US DOT

Dangerous Goods? X
- Proper Shipping Name: Caustic alkali liquid, n.o.s.
- Hazard Class: 8
- Packing Group: II
- UN/ID Number: UN1719
- Transport Label Required: Corrosive
- Technical Name (N.O.S.): Contains monothiophosphate

TRANSPORT CANADA

Dangerous Goods? X
- Proper Shipping Name: Caustic alkali liquid, n.o.s.
- Hazard Class: 8
- Packing Group: II
- UN Number: UN1719
- Transport Label Required: Corrosive
- Technical Name (N.O.S.): Contains monothiophosphate

ICAO / IATA

Dangerous Goods? X
- Proper Shipping Name: Caustic alkali liquid, n.o.s.
- Hazard Class: 8
- Packing Group: II
- UN Number: UN1719
- Transport Label Required: Corrosive
- Technical Name (N.O.S.): Contains monothiophosphate

IMO

Dangerous Goods? X
- Proper Shipping Name: Caustic alkali liquid, n.o.s.

Hazard Class: 8
UN Number: UN1719
Packing Group: II
Transport Label Required: Corrosive
Technical Name (N.O.S.): Contains monothiophosphate

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15. REGULATORY INFORMATION

Inventory Information

United States (USA): All components of this product are included on the TSCA Chemical Inventory or are not required to be listed on the TSCA Chemical Inventory.

Canada: All components of this product are included on the Domestic Substances List (DSL) or are not required to be listed on the DSL.

Australia: All components of this product are included in the Australian Inventory of Chemical Substances (AICS) or are not required to be listed on AICS.

China: One or more components of this product are NOT included on the Chinese (IECSC) inventory.

Japan: One or more components of this product are NOT included on the Japanese (ENCS) inventory.

Korea: One or more components of this product are NOT included on the Korean (ECL) inventory.

Philippines: One or more components of this product are NOT included on the Philippine (PICCS) inventory.

OTHER ENVIRONMENTAL INFORMATION
The following components of this product may be subject to reporting requirements pursuant to Section 313 of CERCLA (40 CFR 372), Section 12(b) of TSCA, or may be subject to release reporting requirements (40 CFR 307, 40 CFR 311, etc.) See Section 13 for information on waste classification and waste disposal of this product.

This product does not contain any components regulated under these sections of the EPA

PRODUCT HAZARD CLASSIFICATION UNDER SECTION 311 OF SARA
- Acute

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16. OTHER INFORMATION

NFPA Hazard Rating (National Fire Protection Association)

Health: 3 - Materials that, under emergency conditions, can cause serious or permanent injury.

Fire: 1 - Materials that must be preheated before ignition can occur.

Instability: 0 - Materials that in themselves are normally stable, even under fire exposure conditions.

Reasons For Issue: New Format

Date Prepared: 03/04/2014
Date of last significant revision: 03/04/2014

Component Hazard Phrases
Monothiophosphates

H314 - Causes severe skin burns and eye damage.

Sodium hydroxide

H290 - May be corrosive to metals.
H314 - Causes severe skin burns and eye damage.
H318 - Causes serious eye damage.

Prepared By: Legal & Compliance Services; E-mail: custinfo@cytec.com

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Material Name: Aluminum Sulfate

* * * Section 1 - Chemical Product and Company Identification * * *

Part Number: NSF Standard Ground or Iron Free
Chemical Name: Aluminum Sulfate, 14.3-Hydrate
Product Use: For Manufacturing Use Including Water Treatment
Synonyms: Sulfuric acid, aluminum salt (3:2); Sulfuric acid, aluminum salt (3:2); Aluminum sulfate; Aluminum sulphate; Aluminum (III) sulfate; Aluminum alum; Aluminum trisulfate; Cake alum; Dialuminum sulfate; Alum; Aluminum sesquisulfate.

Supplier Information

Chem One Ltd.
8017 Pinemont Drive, Suite 100
Houston, Texas 77040-6519

Phone #: (713) 896-9966
Fax #: (713) 896-7540
Emergency #: (800) 424-9300 or (703) 527-3887

General Comments: FOR COMMERCIAL USE ONLY; NOT TO BE USED AS A PESTICIDE.

NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

* * * Section 2 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
10043-01-3	Aluminum Sulfate*	> 98

*Aluminum Sulfate, 14.3 Hydrate is the hydrated form. However, the CAS # 10043-01-3 is for the anhydrous form. Hydrated aluminum sulfate, A12(SO4)3*18H2O, is efflorescent and therefore may have approximately 14 molecules of water. The hydrate form may be indicated as "xH2O" and assigned CAS # 17927-65-0.

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Aluminum, soluble salts, Aluminum (7429-90-5).

Component Information/Information on Non-Hazardous Components

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

* * * Section 3 - Hazards Identification * * *

Emergency Overview

Aluminum Sulfate is an odorless, lustrous white to grayish-white crystalline, granular or powdered solid. This material can cause severe irritation and inflammation, or burns to the eyes and skin. Contact with high concentration or prolonged contact may cause permanent damage. Inhalation of high airborne concentrations may cause constriction of the airways. Dusts can form corrosive sulfuric acid when in contact with moisture in air or tissues. Concentrated solutions are corrosive to the eyes, skin and gastrointestinal tract. When heated to decomposition, Aluminum Sulfate may emit toxic and corrosive fumes of sulfur dioxide and/or sulfur trioxide.

Hazard Statements

WARNING! Causes eye, skin, respiratory tract, and gastrointestinal tract irritation or burns. Harmful if swallowed or inhaled. Do not get in eyes, on skin or on clothing. Do not breathe dusts. Wash thoroughly after handling. Keep container closed. Use only with adequate ventilation.

Potential Health Effects: Eyes

Aluminum Sulfate can cause severe irritation and inflammation of the eyes. Concentrated solutions may cause permanent damage or blindness.

Potential Health Effects: Skin

Aluminum Sulfate dusts can irritate the skin. Concentrated solutions are corrosive and may cause burns and permanent scarring. Prolonged exposure can cause numbing of the fingers. Prolonged contact can result in dermatitis (dry, red, itchy skin).

Potential Health Effects: Ingestion

May cause burns to the mouth, throat and stomach. Symptoms may include vomiting, nausea, bleeding stomach, and abdominal pain. Ingestion of small amounts of aluminum sulfate may cause a sensation of dryness in the mucous membranes of the mouth and throat. Adverse effects on muscle and kidneys, and gum necrosis have been reported after ingestion of large amounts of aluminum compounds. Repeated ingestion over prolonged period can result in phosphate deficiency, which can cause softening and bending of bones. The approximate fatal dose in humans by ingestion is 30 grams.

Material Name: Aluminum Sulfate

* * * Section 3 - Hazards Identification (Continued) * * *

Potential Health Effects: Inhalation

Dusts of this Aluminum Sulfate form sulfuric acid when in contact with moisture in air or tissues. Inhalation of dust or mist is irritating to respiratory tract and mouth. Symptoms of irritation may include coughing, congestion and sore throat. Inhalation of high airborne concentrations may cause constriction of the airways and can result in potentially fatal pulmonary edema (accumulation of fluid in lungs). Chronic inhalation may cause permanent lung damage and reduction of lung function, due to potential for the formation of sulfuric acid, which is corrosive.

HMIS Ratings: Health Hazard: 2* **Fire Hazard:** 0 **Physical Hazard:** 1

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

Immediately flush eyes with large amounts of room temperature water, occasionally lifting the lower and upper lids, for at least 15 minutes. If symptoms persist after 15 minutes of irrigation, seek medical attention.

First Aid: Skin

Remove all contaminated clothing. For skin contact, wash thoroughly with soap and water for at least 20 minutes. Seek immediate medical attention if irritation develops or persists.

First Aid: Inhalation

Remove source of contamination or move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. Get immediate medical attention.

First Aid: Ingestion

DO NOT INDUCE VOMITING, unless directed by medical personnel. Have victim rinse mouth thoroughly with water, if conscious. Never give anything by mouth to a victim who is unconscious or having convulsions. Contact a physician or poison control center immediately.

First Aid: Notes to Physician

Treatment is largely symptomatic. If contamination of eyes has occurred, administer anesthetic drops to facilitate eye irrigation. Be observant for pulmonary edema after inhalation exposure.

* * * Section 5 - Fire Fighting Measures * * *

Flash Point: Not combustible
Method Used: Not applicable
Upper Flammable Limit (UFL): Not applicable
Lower Flammable Limit (LFL): Not applicable
Auto Ignition: Not applicable
Flammability Classification: Not applicable
Rate of Burning: Not applicable

General Fire Hazards

Product will not ignite, but may burn. Caution: Sufficient heat may produce toxic gases. Product will decompose at its melting point [770°C (1418°F)]. In contact with water and metals, flammable hydrogen gas can be generated which can result in a fire hazard. Sealed containers can rupture violently in the heat of a fire.

Hazardous Combustion Products

When heated above 650-770°C (1200-1418°F) Aluminum Sulfate forms sulfur dioxide, sulfur trioxide, aluminum oxide and sulfuric acid.

Extinguishing Media

Dry chemical, foam, carbon dioxide. Do not use water; corrosive sulfuric acid will form.

Fire Fighting Equipment/Instructions

Firefighters should wear full protective clothing. Move container from fire area, if this is without risk. Fight fire from a safe distance. Cool containers with fine water spray, taking care to avoid wetting product.

NFPA Ratings: Health: 2 **Fire:** 0 **Instability:** 1 **Other:**

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Material Name: Aluminum Sulfate

* * * Section 6 - Accidental Release Measures * * *

Containment Procedures

Stop the flow of material, if this can be done without risk. Contain the discharged material. If sweeping of a contaminated area is necessary use a dust suppressant agent, which does not react with product (see Section 10 for incompatibility information).

Clean-Up Procedures

Wear appropriate protective equipment and clothing during clean-up. Shovel the material into waste container. Thoroughly wash the area after a spill or leak clean-up. Solutions of the compound can be neutralized with lime or similar compound. Avoid contamination of soil, and prevent spill residue from running to groundwater or storm drains.

Evacuation Procedures

Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. Keep materials that burn away from spilled material. In case of large spills, follow all facility emergency response procedures.

Special Procedures

Remove soiled clothing and launder before reuse. Avoid all skin contact with the spilled material. Have emergency equipment readily available.

* * * Section 7 - Handling and Storage * * *

Handling Procedures

All employees who handle this material should be trained to handle it safely. Do not breathe dust. Avoid all contact with skin and eyes. Use this product only with adequate ventilation. Wash thoroughly after handling.

Storage Procedures

Keep container tightly closed when not in use. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be stored in secondary containers or in a diked area, as appropriate. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). Storage areas should be made of fire-resistant materials. Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Use corrosion-resistant structural materials, lighting, and ventilation systems in the storage area. Floors should be sealed to prevent absorption of this material. Have appropriate extinguishing equipment in the storage area (i.e., sprinkler system, portable fire extinguishers).

Empty containers may contain residual particulates; therefore, empty containers should be handled with care. Do not cut, grind, weld, or drill near this container. Never store food, feed, or drinking water in containers that held this product. Keep this material away from food, drink and animal feed. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Do not store this material in open or unlabeled containers. Limit quantity of material stored. Store in suitable containers that are corrosion-resistant. Keep containers closed-material is hygroscopic.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Exposure Guidelines

A: General Product Information

Follow the applicable exposure limits.

B: Component Exposure Limits

Aluminum Sulfate (10043-01-3)

ACGIH: as Al; 2 mg/m^3 TWA (related to Aluminum, soluble salts)

OSHA: as Al: 2 mg/m^3 TWA (Listed under 'Aluminum') (related to Aluminum, soluble salts) [1989 Vacated 1989 PEL]

NIOSH: total: 2 mg/m^3 TWA (related to Aluminum, soluble salts and alkyls); respirable dust: 5 mg/m^3 TWA; pyro powders and welding fumes: 5 mg/m^3 TWA

Engineering Controls

Control airborne dusts and use mechanical ventilation. Local exhaust methods are suggested, where possible, in enclosed or confined spaces. Use a corrosion-resistant ventilation system. Supply ample air replacement. Treatment of exhaust gases may be required to prevent environmental contamination.

PERSONAL PROTECTIVE EQUIPMENT

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132). Please reference applicable regulations and standards for relevant details.

Personal Protective Equipment: Eyes/Face

Wear chemical safety goggles. If necessary, refer to U.S. OSHA 29 CFR 1910.133.

Material Name: Aluminum Sulfate

* * * Section 8 - Exposure Controls / Personal Protection (Continued) * * *

Personal Protective Equipment: Skin

Where contact is likely, wear chemical resistant gloves, rubber boots, and coveralls. Butyl rubber, natural rubber, polyethylene, polyvinyl chloride or neoprene gloves are recommended. Polyvinyl alcohol and very thin rubber, nitrile, or PVC gloves are NOT recommended. Gloves should be tested to determine suitability for prolonged contact with this material. If necessary, refer to U.S. OSHA 29 CFR 1910.138.

Personal Protective Equipment: Respiratory

None required where adequate ventilation conditions exist. If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection. Currently, there are no NIOSH respiratory guidelines for this material. NIOSH guidelines for sulfuric acid may be appropriate, depending on use of Aluminum Sulfate. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

Personal Protective Equipment: General

Wash hands thoroughly after handling material. Do not eat, drink or smoke in work areas. Have a safety shower or eye-wash fountain available. Use good hygiene practices when handling this material including changing and laundering work clothing after use. Discard contaminated shoes and leather goods.

* * * Section 9 - Physical & Chemical Properties * * *

Physical Properties: Additional Information

The data provided in this section are to be used for product safety handling purposes. Please refer to Product Data Sheets, Certificates of Conformity or Certificates of Analysis for chemical and physical data for determinations of quality and for formulation purposes.

Appearance:	Lustrous white to grayish-white solid	**Odor:**	Odorless
Physical State:	Crystalline, granules or powder	**pH:**	3.0-4.0 (5% aqueous solution at 25 deg C)
Vapor Pressure:	Essentially 0 mm Hg	**Vapor Density:**	Not applicable
Boiling Point:	> 1600 deg C (2912 deg F) [anhydrous]	**Freezing/Melting Point:**	Decomp at 770 deg C (1418 deg F)
Solubility (H2O):	87.5 g/100mL at 20 deg C	**Specific Gravity:**	1.95 at 4 deg C
Refractive Index:	1.47	**Particle Size:**	149-200 microns
Softening Point:	Not applicable	**Evaporation Rate:**	Not applicable
Viscosity:	Not applicable	**Bulk Density:**	0.96 g/cc
Percent Volatile:	Not available	**Molecular Weight:**	599.75 (342.14,Anhydrous)
		Chemical Formula:	$Al_2(SO_4)_3 \bullet 14.3H_20$

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

Normally stable. In contact with water, sulfuric acid is formed with evolution of some amount of heat. When exposed to air, loss of combined water molecules by a hydrated material, such as this compound, will result in partial decomposition. Aluminum Sulfate is hydroscopic and will absorb moisture from the air.

Chemical Stability: Conditions to Avoid

Avoid contact with moisture, excessive heat and incompatible materials listed below.

Incompatibility

Aluminum Sulfate is incompatible with strong oxidizing agents and strong bases (may react violently), moisture and most common metals in presence of moisture.

Hazardous Decomposition

Thermal decomposition: Sulfur dioxide, sulfur trioxide, and aluminum oxide. In contact with water: sulfuric acid.

Hazardous Polymerization

Will not occur.

Material Name: Aluminum Sulfate

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

Severely irritating or corrosive to the skin, eyes and gastrointestinal tract. Prolonged exposure to the skin may cause numbing effects. Product can cause severe irritation and inflammation of the eyes. Concentrated solutions may cause permanent damage to eyes or skin, or blindness. Dusts of this product form sulfuric acid when in contact with moisture in air or tissues. Inhalation of dust or mist is irritating to respiratory tract and mouth. Symptoms of irritation may include coughing, congestion and sore throat. High concentrations may cause constriction of the airways. Ingestion may cause burns to the mouth, throat and stomach. Symptoms may include vomiting, nausea, bleeding stomach, and abdominal pain. Soluble aluminum compounds can be absorbed from the gut, and excess levels can be deposited in bone. Once absorbed, aluminum is eliminated rapidly by the kidneys, unless renal failure is present. Repeated ingestion of this product can weaken bones by phosphate deficiency. Ingestion of large amounts of Aluminum Sulfate by humans has resulted in death. Lethality by ingestion is probably due to the corrosive action of the sulfuric acid formed by the hydrolysis of the salt. Ingestion of small amounts of aluminum sulfate may cause a sensation of dryness in the mucous membranes of the mouth and throat.

B: Component Analysis - LD50/LC50

Aluminum Sulfate (10043-01-3)

LD_{50} (Unreported-Rat) 410 mg/kg; LD_{50} (Oral-Mouse) 6207 mg/kg; LD_{50} (Intraperitoneal-Mouse) 274 mg/kg; LD_{50} (Unreported-Mouse) 520 mg/kg; LD_{50} (Unreported-Guinea Pig) 490 mg/kg

B: Component Analysis - TDLo/LDLo

Aluminum Sulfate (10043-01-3)

TDLo (Oral-Rat) 10138 mg/kg/8 days-continuous: Kidney, Ureter, Bladder: other changes in urine composition; Nutritional and Gross Metabolic: changes in phosphorus; TDLo (Intraperitoneal-Mouse) 800 mg/kg: female 10-13 day(s) after conception: Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain) Reproductive: Effects on Newborn: behavioral; TDLo (Intratesticular-Rat) 27371 µg/kg: male 1 day(s) pre-mating: Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count), testes, epididymis, sperm duct; TDLo (Subcutaneous-Mouse) 27371 µg/kg: male 30 day(s) pre-mating: Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count), testes, epididymis, sperm duct

Carcinogenicity

A: General Product Information

Information not available.

B: Component Carcinogenicity

This compound is not listed by ACGIH, EPA, IARC, OSHA, NIOSH, or NTP.

Epidemiology

Information not available.

Neurotoxicity

With extensive exposures, aluminum may accumulate in brain tissue producing neurotoxicity, including encephalopathy and seizures (based on animal data).

Mutagenicity

A solution of Aluminum Sulfate in water produced positive results in cultured human cells (leukolytes), via sister chromatid exchanges, micronuclei and chromosomal aberrations). Negative results have been obtained in bacteria and cultured mammalian cells.

Teratogenicity

In 88 women exposed during pregnancy to excessive Aluminum Sulfate levels in drinking water, the outcome of pregnancy, fetal viability and birth weight parameters were normal compared to unexposed controls. The only significant difference found in the infants of exposed mothers was an increase in skeletal malformations of the foot.

Other Toxicological Information

On occasion workers chronically exposed to aluminum-containing dusts or fumes have developed severe pulmonary reactions including fibrosis, emphysema and pneumothorax. A much rarer encephalopathy has also been described. The factors which predispose to lung damage are not well characterized.

Material Name: Aluminum Sulfate

* * * Section 12 - Ecological Information * * *

Ecotoxicity

Spills into water will result in hydrolysis to sulfuric acid solution with the capability of producing burns.

TLm (mosquito fish) 48 hours = 240 ppm; Fatal (fundulus) 36 hours = 14 ppm (fresh water); LC_{50} (Largemouth bass) 96 hours = 250 ppm

Environmental Fate

Bioconcentration: No potential for food chain concentration. Aluminum sulfate will slowly be precipitated to Al(OH)3 due to natural alkalinity. A study was undertaken to assess the possibility of aluminum bioaccumulation (in rainbow trout). Trout tissues, plankton, and water were analyzed for total aluminum concentration. Statistical comparisons of experimental and control tissues revealed few overall significant differences in the level of aluminum between alum-exposed and non-exposed fish, but significant differences existed between tissues within a given treatment and age class

* * * Section 13 - Disposal Considerations * * *

US EPA Waste Number & Descriptions

A: General Product Information

As shipped, product is not considered a hazardous waste by the EPA. However, product should be tested for corrosivity to determine if Waste Number D002 applies.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this compound.

Disposal Instructions

Review federal, provincial, and local government requirements prior to disposal. Disposal by controlled incineration or secure landfill may be acceptable.

* * * Section 14 - Transportation Information * * *

NOTE: The shipping classification information in this section (Section 14) is meant as a guide to the overall classification of the product. However, transportation classifications may be subject to change with changes in package size. Consult shipper requirements under I.M.O., I.C.A.O. (I.A.T.A.) and 49 CFR to assure regulatory compliance.

US DOT Information

UN/NA #: Not Applicable
Shipping Name: Non-regulated
Hazard Class: Not Applicable
Packing Group: Not Applicable
Required Label(s): None
Additional Info:: When shipped as a single bulk package equal to 5000 pounds or more, this material is regulated as a U.S. DOT hazardous material as the following: RQ, UN 3077, Environmentally Hazardous Substance, Solid, n.o.s., (Aluminum Sulfate), 9, PG III, Label Class 9.

International Air Transport Association (IATA)

For Shipments by Air transport: We classify this product as hazardous (Class 9) when shipped by air because 49 CFR 173.140 (a). "For the purposes of this subchapter, miscellaneous hazardous material (Class 9) means a material which presents a hazard during transportation, but which does not meet the definition of any other hazard class. This class includes: (a) Any material which has an anesthetic, noxious, or other similar property which could cause extreme annoyance or discomfort to a flight crew member so as to prevent the correct performance of assigned duties."

UN: UN 3077
Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s. (aluminum sulfate)
Hazard Class: 9
Packing Group: III
Passenger & Cargo Aircraft Packing Instruction: 911
Passenger & Cargo Aircraft Maximum Net Quantity: 400 kg
Limited Quantity Packing Instruction (Passenger & Cargo Aircraft): Y911
Limited Quantity Maximum Net Quantity (Passenger & Cargo Aircraft): 30 kg
Special Provisions: A97 A149
ERG Code: 9L

International Maritime Organization (I.M.O.) Classification

Aluminum Sulfate is not regulated under I.M.O.

Material Name: Aluminum Sulfate

* * * Section 15 - Regulatory Information * * *

US Federal Regulations

A: General Product Information

Aluminum Sulfate is designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance.

B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4):

Aluminum Sulfate (10043-01-3)

SARA 302 (EHS TPQ) There are no specific Threshold Planning Quantities for Aluminum Sulfate. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs. (4,540 kg) therefore applies, per 40 CFR 370.20.

CERCLA: Final RQ = 5000 pounds (2270 kg)

C: Sara 311/312 Tier II Hazard Ratings:

Component	CAS #	Fire Hazard	Reactivity Hazard	Pressure Hazard	Immediate Health Hazard	Chronic Health Hazard
Aluminum Sulfate	10043-01-3	No	No	No	Yes	Yes

State Regulations

A: General Product Information

Other state regulations may apply.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Aluminum Sulfate (* related to Aluminum) (** related to Aluminum, soluble salts)	10043-01-3	Yes	Yes*	Yes	Yes**	Yes	Yes

Other Regulations

A: General Product Information

Not determined.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Aluminum Sulfate	10043-01-3	Yes	Yes	Yes

C: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Aluminum Sulfate	10043-01-3	1% item 53 (198) (related to Aluminum, soluble salts)

ANSI Labeling (Z129.1):

CAUTION! MAY CAUSE RESPIRATORY SYSTEM, SKIN AND EYE IRRITATION OR BURNS. HARMFUL IF INGESTED OR INHALED. Avoid contact with skin, eyes, or clothing. Do not taste or swallow. Avoid breathing dusts and particulates. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves, goggles, faceshields, suitable body protection, and NIOSH-approved respiratory protection, as appropriate. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention. **IN CASE OF FIRE:** Use water fog, dry chemical, CO_2, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with inert material. Sweep-up, avoiding generation of dusts. Place residue in suitable container. Consult Material Safety Data Sheet for additional information.

Material Name: Aluminum Sulfate

* * * Section 16 - Other Information * * *

Other Information

Chem One Ltd. ("Chem One") shall not be responsible for the use of any information, product, method, or apparatus herein presented ("Information"), and you must make your own determination as to its suitability and completeness for your own use, for the protection of the environment, and for health and safety purposes. You assume the entire risk of relying on this Information. In no event shall Chem One be responsible for damages of any nature whatsoever resulting from the use of this product or products, or reliance upon this Information. By providing this Information, Chem One neither can nor intends to control the method or manner by which you use, handle, store, or transport Chem One products. If any materials are mentioned that are not Chem One products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed. Chem One makes no representations or warranties, either express or implied of merchantability, fitness for a particular purpose or of any other nature regarding this information, and nothing herein waives any of Chem One's conditions of sale. This information could include technical inaccuracies or typographical errors. Chem One may make improvements and/or changes in the product (s) and/or the program (s) described in this information at any time. If you have any questions, please contact us at Tel. 713-896-9966 or E-mail us at Safety@chemone.com.

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration

Contact: Sue Palmer-Koleman, PhD **Contact Phone:** (713)-896-9966

Revision Log

07/11/00 10:30 AM SEP Company name revised, Sect 1 and 16, from Corporation to Ltd.
05/14/01 9:31 AM HDF Checked exposure limits; made changes to Sect 9; overall review, add SARA 311/312 Haz Ratings.
07/24/01 2:09 PM CLJ Add Shipments by Air information to Section 14, Changed contact to Sue, non-800 Chemtrec Num.
08/06/03: 8:09 AM HDF General review and up-date of entire MSDS. Up-graded Section 10 Reactivity Information. Up-date of HMIS categories. Up-date of Section 8. Up-date of Section 14.
06/22/05 11:45 AM SEP Update IATA Section 14.
10/17/07 3:22 PM SEP Update IATA Section 14, added RQ information to DOT section.
01/04/08 12:30 PM HDF Change NFPA 'Reactivity Hazard' to 'Instability Hazard'.

This is the end of MSDS # C1-166

MATERIAL SAFETY DATA SHEET

Suncoast Research labs, Inc.
P.O. Box 47254St. Petersburg, FL 33743
PH: 727-344-7627 FAX: 727-341-0504

HMIS DESIGNATION
HEALTH: 1 FIRE: 2 REACTIVITY: 0

IDENTIFICATION

TRADE NAME: Citrus King "The King of All Natural Cleaners"
CHEMICAL FAMILY: Natural Solvent CAS# 94266-27-4

D.O.T.: Not DOT Regulated for domestic ground shipments in containers < 120 gallons

REGULATED FOR AIR AND OCEAN FREIGHT:

UN 2319 TERPENE HYDROCARBONS, N.O.S., CLASS 3, FLAMMABLE LIQUID

SAFE HANDLING PROCEDURES

Precautions To Be Taken In Handling And Storage: Usual precautions for combustible liquids. Keep temperature below 115`F and above 5`F. Store in tightly sealed, full containers. Clean up all spills. All handling equipment should be electrically grounded. Product may expand slightly in storage causing pressure to build on container. Open container carefully if product appears to be under pressure. Wash hands thoroughly after handling. Citrus King is a strong solvent, and may attack certain kinds of rubber articles. Users should satisfy themselves that it is appropriate for their application.

PROTECTIVE EQUIPMENT

EYES: Splash-proof Goggles

SKIN: Gloves, Nylon, Teflon, Vinyl

VENTILATION REQUIREMENTS
Local exhaust should be adequate.

RESPIRATORY
Not normally required, but if vapor concentration becomes high, use self contained air mask.

SPECIAL CLOTHING/EQUIPMENT:
Usually not needed. Apron and Boots same as above. Avoid Prolonged Contact

HAZARDOUS COMPONENTS AS DEFINED BY THE STANDARD

Component	SARA III (EPCRA)	CERCLA	OSHA HAZARD
Terpenes	Not reportable or listed	Not reportable	Combustible, skin irritant

This product contains neither petroleum distillates nor chlorinated hydrocarbons. The exact composition of this formulation is a trade secret.

Please Note: Judgement Is Based On Indirect Test Data

FIRE, EXPLOSION AND REACTIVITY DATA

FLASH POINT: 115 F **METHOD:** Pensky Martens closed cup
FLAMMABLE EXPLOSIVE LIMITS (AIR) - LEL: Not determined **UEL:** Not determined
EXTINGUISHING MEDIA: Dry Foam, Chemical, CO_2
SPECIAL HAZARDS - FIRE FIGHTING PROCEDURES: Self Contained Breathing Apparatus recommended. Do not use water; handle as an oil fire (Class B fire procedures).
HAZARDOUS DECOMPOSITION PRODUCTS: When heated to decomposition, emits acrid smoke and irritating fumes. Burning generates CO and CO_2. Product is not an oxygen donor.
MATERIAL IS STABLE X **HAZARDOUS POLYMERIZATION** NO
CONDITIONS TO AVOID: Extreme heat. Polymerization catalysts, such as aluminum chloride. Keep away from sparks and open flame.
INCOMPATIBILITY: (MATERIALS TO AVOID) Strong oxidizing agents and acidic agents, including clays.

HEALTH HAZARD DATA

PRIMARY ROUTES OF EXPOSURE: INHALATION N **SKIN CONTACT** Y **SKIN ABSORPTION** N
INGESTION UNLIKELY **EYES** Y

EFFECTS OF OVEREXPOSURE:
INHALATION: None Known
SKIN CONTACT: May be irritating.
INGESTION: Harmful if swallowed.
EYES: May be irritating.
CHRONIC: Existing eye, skin, and upper respiratory inflammation may be aggravated by exposure.

TOXICOLOGY: CONTAINS NO CARCINOGENS AS DETERMINED BY THE STANDARD.

EMERGENCY FIRST AID PROCEDURES:

EYES: Flush with water for at least 15 minutes. If irritation persists see a physician.
SKIN: Wash with soap and water.
INHALATION: Remove to fresh air, if symptoms persist, seek medical attention.
INGESTION: Give milk of magnesia, or a glass or two of water or milk. See a physician. Never give anything by mouth to an unconscious person.

CONTROL PROCEDURES - SPILL, LEAKAGE OR DISPOSAL

STEPS TO BE TAKEN IF MATERIAL IS SPILLED: Soak up with absorbent material.
CAUTION: Slippery On Floor.
WASTE DISPOSAL METHOD: Incinerate or dispose of in accordance with local, state and federal regulations

PHYSICAL DATA

APPEARANCE AND ODOR: Amber liquid, citrus odor.
BOILING POINT: >310`F (estimated)
FREEZING POINT: Not determined
EVAPORATION RATE: (ETHER=1) less than 1
SOLUBILITY IN WATER: Insoluble

DATE OF PREPARATION: 10/9/08

Material Safety Data Sheet
HYDRATED LIME

Rev. Date:5/1/2008

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name:	**Hi-Cal Hydrate**	
Synonym/s:	**Hydrate, High Calcium Hydrated Lime, Type N Hydrated Lime, HL**	
Manufacturer:	**US Operations:** **Chemical Lime Co.** **3700 Hulen St.** **Fort Worth, TX 76107** **817-732-8164**	**Canadian Operations:** **Chemical Lime Co. of Canada Inc.** **20302-102B Ave.** **Langley, BC V1M 3H1** **604-888-4333**
Emergency Phone:	**Chemtrec 1-800-424-9300**	
Chemical Name: **Chemical Family:** **Chemical Formula:**	**Calcium Hydroxide** **Alkaline Earth Hydroxide** **$Ca(OH)_2$**	**WHMIS Classification:** **D2A, E**
Product Use/s:	**Water treatment, pH adjustment, FGT, Construction, Pulp/Paper**	
Prepared By:	**Chemical Lime Co.** **R&D/Technical Services, KSA**	

SECTION 2: COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	CAS	OSHA PEL, TWA 8/40h (mg/m3)	ACGIH TLV, TWA 8/40h (mg/m3)	NIOSH REL, TWA 8/40h (mg/m3)	NIOSH IDLH (mg/m3)	Conc. (%)
Calcium Hydroxide, $Ca(OH)_2$ (Hydrated Lime)	**1305-62-0**	**15** (total dust) **5** (respirable)	**5**	**5**	**N.A.**	**> 90**
Magnesium Hydroxide, $Mg(OH)_2$ (Brucite)	**1309-42-8**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**< 5**
Magnesium Oxide, MgO (Periclase)	**1309-48-4**	**10**	**10**	**N.A.**	**N.A.**	**< 5**
Calcium Carbonate, $CaCO_3$ (Limestone)	**1317-65-3 (471-34-1)**	**15** (total dust) **5** (respirable)	**10**	**10** (total dust) **5** (respirable)	**N.A.**	**< 3**
Crystalline Silica, SiO_2 (Quartz)	**14808-60-7**	**10/(SiO2% + 2)** (respirable)	**0.025** (respirable)	**0.05** (respirable)	**50**	**< 2**

OSHA Regulatory Status: This material is subject to 29 CFR 1910.1200 (Hazard Communication).

SECTION 3: HAZARDS IDENTIFICATION

Emergency Overview: Hydrate is an odorless white or grayish-white powder. Contact can cause irritation to eyes, skin, respiratory system, and gastrointestinal tract.

Potential Health Effects

Eyes: Contact can cause severe irritation or burning of eyes, including permanent damage.

Skin: Contact can cause irritation of skin.

Ingestion: This product can cause severe irritation of gastrointestinal tract if swallowed.

Inhalation: This product can cause severe irritation of the respiratory system. Long-term exposure may cause permanent damage. Hydrate is not listed by MSHA, OSHA, or IARC as a carcinogen However, this product may contain trace amounts of crystalline silica in the form of quartz or crystobalite, which has been classified by IARC as a Group I carcinogen to humans when inhaled. Inhalation of silica can also cause a chronic lung disorder, silicosis.

Medical Conditions Aggravated by Exposure: Contact may aggravate disorders of the eyes, skin, gastrointestinal tract, and respiratory system.

Potential Environmental Effects: This material is alkaline and if released into water or moist soil will cause an increase in pH.

SECTION 4: FIRST AID MEASURES

Eyes: Immediately flush eyes with generous amounts of water or eye wash solution if water is unavailable. Pull back eyelid while flushing to ensure that all lime dust has been washed out. Seek medical attention promptly if the initial flushing of the eyes does not remove the irritant. Do not rub eyes.

Skin: Brush off or remove as much dry lime as possible. Wash exposed area with large amounts of water. If irritation persists, seek medical attention promptly.

Inhalation: Move victim to fresh air. Seek medical attention. If breathing has stopped, give artificial respiration.

Ingestion: Do not induce vomiting. Seek medical attention immediately. Never give anything by mouth unless instructed to do so by medical personnel.

SECTION 5: FIRE FIGHTING MEASURES

Fire Hazards:	Hydrate is not combustible or flammable. However, hydrate reacts vigorously with acids, and may release heat sufficient to ignite combustible materials in specific instances. Hydrate is not considered to be an explosion hazard, although reaction with acids or other incompatible materials may rupture containers.
Hazardous Combustion Products:	None
Extinguishing Media:	Use dry chemical fire extinguisher. Do not use water or halogenated compounds, except that large amounts of water may be used to deluge small quantities of hydrate.
Fire Fighting Instructions:	Keep personnel away from and upwind of fire. Avoid skin contact or inhalation of dust. Wear full fire-fighting turn-out gear (full Bunker gear), and respiratory protection (SCBA).

SECTION 6: ACCIDENTAL RELEASE MEASURES

Spill / Leak Procedures:	**Do Not** use water on bulk material spills. Use proper protective equipment.
Small Spills:	Use dry methods to collect spilled materials. Avoid generating dust. Do not clean up with compressed air. Store collected materials in dry, sealed plastic or non-aluminum metal containers. Residue on surfaces may be water washed.
Large Spills:	Use dry methods to collect spilled materials. Evacuate area downwind of clean-up operations to minimize dust exposure. Store spilled materials in dry, sealed plastic or non-aluminum metal containers.
Containment:	Minimize dust generation and prevent bulk release to sewers or waterways.
Clean-up:	Residual amounts of material can be flushed with large amounts of water. Equipment can be washed with either a mild vinegar and water solution, or detergent and water.

SECTION 7: HANDLING AND STORAGE

Handling:	Keep in tightly closed plastic or non-aluminum metal containers. Protect containers from physical damage. Avoid direct skin contact with the material.
Storage:	Store in a cool, dry, and well-ventilated location. Do not store near acids or other incompatible materials. Keep away from moisture. Do not store or ship in aluminum containers.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:	Provide ventilation adequate to maintain PELs.
Respiratory Protection:	Use NIOSH/MSHA approved respirators if airborne concentration exceeds PELs.
Skin Protection:	Use appropriate gloves and footwear to prevent skin contact. Clothing should fully cover arms and legs. Should lime get inside clothing or gloves, remove the clothing and the lime promptly.
Eye Protection:	Use safety glasses with side shields or safety goggles. Contact lenses should not be worn when working with lime products.
Other:	Eye wash fountain/stations and emergency showers should be available.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	**Odor:**	**Physical State:**
White or grayish-white powder	Odorless	Solid
Boiling Point (°C/°F):	**Melting Point (°C/°F):**	**Specific Gravity**
2850 / 5162	dec 580 / 1076	(Apparent) g/cc: 0.4 - 0.55 (True) g/cc: 2.2 - 2.4
Vapor Pressure (mm Hg):	**Vapor Density:**	**Evaporation Rate:**
N.A.	N.A.	N.A.
Solubility in Water	**pH (25°C/77°F):**	
Slightly soluble in water.	12.4	

SECTION 10: STABILITY AND REACTIVITY

Stability: Chemically stable, but slowly reacts with carbon dioxide to form calcium carbonate. See also Incompatibility below.

Incompatibility/ Conditions to Avoid: Hydrate should not be mixed or stored with the following materials, due to the potential for vigorous reaction and release of heat:

Acids (unless in a controlled process)	Organic Acid Anhydrides
Reactive Fluoridated Compounds	Nitro-Organic Compounds
Reactive Brominated Compounds	Reactive Phosphorous Compounds
Reactive Powdered Metals	Interhalogenated Compounds

Hazardous Decomposition Products: None

Hazardous Polymerization: None

SECTION 11: TOXICOLOGICAL INFORMATION

ORL-RAT LD50: 7,340 MG/KG
ORL-MUS LD50: 7,300 MG/KG

Hydrated Lime is not listed by MSHA, OSHA, or IARC as a carcinogen, but this product may contain trace amounts of crystalline silica, which has been classified by IARC as carcinogenic to humans when inhaled in the form of quartz or crystobalite.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity: Because of the high pH of this product, it would be expected to produce significant ecotoxicity upon exposure to aquatic organisms and aquatic systems in high concentrations.

Environmental Fate: This material shows no bioaccumulation effect or food chain concentration toxicity.

SECTION 13: DISPOSAL CONSIDERATIONS

Dispose of in accordance with all applicable federal, state, and local environmental regulations. If this product as supplied, and unmixed, becomes a waste, it will not meet the criteria of a hazardous waste as defined under the U.S. Resource Conservation and Recovery Act (RCRA).

SECTION 14: TRANSPORTATION INFORMATION

Hydrate is not classified as a hazardous material by US DOT and is not regulated by the Transportation of Dangerous Goods (TDG) when shipped by any mode of transport.

SECTION 15: REGULATORY INFORMATION

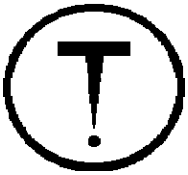
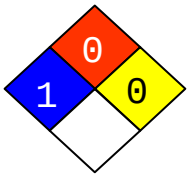
U.S. EPA Regulations:
RCRA Hazardous Waste Number (40 CFR 261.33): not listed
RCRA Hazardous Waste Classification (40 CFR 261): not classified
CERCLA Hazardous Substance (40 CFR 302.4) unlisted specific per RCRA, Sec. 3001; CWA, Sec. 311(b)(4); CWA, Sec. 307(a), CAA, Sec. 112
CERCLA Reportable Quantity (RQ), not listed
SARA 311/312 Codes: not listed
SARA Toxic Chemical (40 CFR 372.65): not listed
SARA EHS (Extremely Hazardous Substance) (40 CFR 355): not listed, Threshold Planning Quantity (TPQ): not listed
All chemical ingredients are listed on the USEPA TSCA Inventory List.

OSHA/MSHA Regulations:
Air Contaminant (29 CRF 1910.1000, Table Z-1, Z-1-A): 5mg/M^3 TWA-8
MSHA: not listed
OSHA Specifically Regulated Substance (29 CFR 1910): not listed

State Regulations:
Consult state and local authorities for guidance. Components found in this product may contain trace amounts of inherent naturally occurring elements (such as, but not limited to arsenic and cadmium) that may be regulated.

Canada:
WHMIS Classification: "D2A" Materials Causing Other Toxic Effects
WHMIS Classification: "E" Corrosive Materials (listed due to corrosive effect on aluminum)
Canada DSL: Listed

NFPA Hazard Class: Health: 1 Flammability: 0 Reactivity: 0
HMIS Hazard Class: Health: 1 Flammability: 0 Reactivity: 0 Personal Protection: E

SECTION 16: OTHER INFORMATION

Prepared By: **Chemical Lime Company, R&D/Technical Services, KSA**

Chemical Lime Company provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person. Individuals receiving this information must consult their own technical and legal advisors and/ or exercise their own judgment in determining its appropriateness for a particular purpose. Chemical Lime Company makes no representations or warranties, either express or implied, including without limitation and warranties of merchantability or fitness for a particular purpose with respect to the information set forth herein or the product(s) to which the information refers. Accordingly, Chemical Lime Company will not be responsible or liable for any claims, losses or damages resulting from the use of or reliance upon or failure to use this information.

Material Safety Data Sheet
The Dow Chemical Company

Product Name: Methyl Isobutyl Carbinol

Issue Date: 08/20/2012
Print Date: 21 Aug 2012

The Dow Chemical Company encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name
Methyl Isobutyl Carbinol

COMPANY IDENTIFICATION
The Dow Chemical Company
2030 Willard H. Dow Center
Midland, MI 48674
United States

Customer Information Number: 800-258-2436
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 989-636-4400
Local Emergency Contact: 989-636-4400

2. Hazards Identification

Emergency Overview
Color: Colorless
Physical State: Liquid.
Odor: Mild
Hazards of product:

WARNING! Combustible liquid and vapor. Causes eye irritation. May be harmful if inhaled. May cause anesthetic effects. May cause respiratory tract irritation. Aspiration hazard. Can enter lungs and cause damage. Vapor explosion hazard. Vapors may travel a long distance; ignition and/or flash back may occur. Isolate area. Keep upwind of spill. Stay out of low areas. Possible cancer hazard. May cause cancer based on animal data.

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects

Eye Contact: May cause moderate eye irritation. May cause moderate corneal injury. Vapor may cause eye irritation experienced as mild discomfort and redness.
Skin Contact: Prolonged contact may cause slight skin irritation with local redness. May cause drying and flaking of the skin.
Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.
Inhalation: Prolonged excessive exposure may cause adverse effects. Excessive exposure may cause irritation to upper respiratory tract (nose and throat) and lungs. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.
Ingestion: Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.
Aspiration hazard: Aspiration into the lungs may occur during ingestion or vomiting, causing lung damage or even death due to chemical pneumonia.
Effects of Repeated Exposure: Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed. In animals, effects have been reported on the following organs: Kidney.
Cancer Information: For the minor component(s) Has caused cancer in some laboratory animals. However, the relevance of this to humans is unknown.

3. Composition Information

Component	CAS #	Amount
Methylisobutylcarbinol	108-11-2	> 98.0 %
2,6-Dimethyl-4-heptanone	108-83-8	< 2.0 %
Methyl isobutyl ketone	108-10-1	< 1.0 %

4. First-aid measures

Description of first aid measures

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Inhalation: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.
Skin Contact: Wash skin with plenty of water.
Eye Contact: Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.
Ingestion: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

Most important symptoms and effects, both acute and delayed

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), no additional symptoms and effects are anticipated.

Indication of immediate medical attention and special treatment needed

Maintain adequate ventilation and oxygenation of the patient. May cause asthma-like (reactive airways) symptoms. Bronchodilators, expectorants, antitussives and corticosteroids may be of help. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. The decision of whether to induce vomiting or not should be made by a physician. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

Repeated excessive exposure may aggravate preexisting lung disease. Skin contact may aggravate preexisting dermatitis.

5. Fire Fighting Measures

Suitable extinguishing media

Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

Special hazards arising from the substance or mixture

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.
Unusual Fire and Explosion Hazards: Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Do not use direct water stream. May spread fire. Eliminate ignition sources. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Avoid accumulation of water. Product may be carried across water surface spreading fire or contacting an ignition source.
Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. Keep out of sewers. Isolate area. Refer to Section 7, Handling, for additional precautionary measures. Keep unnecessary and unprotected personnel from entering the area. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Small spills: Absorb with materials such as: Sand. Vermiculite. Large spills: Contain spilled material if possible. Collect in suitable and properly labeled containers. Pump with explosion-proof equipment. If available, use foam to smother or suppress. See Section 13, Disposal Considerations, for additional information.
Ignition Sources Removal: Keep away from sources of ignition.
Dust Control: Not applicable.

7. Handling and Storage

Handling

General Handling: Keep away from heat, sparks and flame. Avoid contact with eyes. Avoid breathing vapor. No smoking, open flames or sources of ignition in handling and storage area. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Electrically ground and bond all equipment. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation.
Other Precautions: Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation.

Storage

Minimize sources of ignition, such as static build-up, heat, spark or flame.

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
Methylisobutylcarbinol	ACGIH	TWA	25 ppm SKIN
	ACGIH	STEL	40 ppm SKIN
	OSHA Table Z-1	PEL	100 mg/m3 25 ppm SKIN
2,6-Dimethyl-4-heptanone	ACGIH	TWA	25 ppm
	OSHA Table Z-1	PEL	290 mg/m3 50 ppm
Methyl isobutyl ketone	ACGIH	TWA	20 ppm BEI
	ACGIH	STEL	75 ppm BEI
	OSHA Table Z-1	PEL	410 mg/m3 100 ppm

A BEI notation following the exposure guideline refers to a guidance value for assessing biological monitoring results as an indicator of the uptake of a substance from all routes of exposures.
A "skin" notation following the inhalation exposure guideline refers to the potential for dermal absorption of the material including mucous membranes and the eyes either by contact with vapors or by direct skin contact.
It is intended to alert the reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposures should be considered.

Personal Protection

Eye/Face Protection: Use chemical goggles. If exposure causes eye discomfort, use a full-face respirator.
Skin Protection: Wear clean, body-covering clothing.

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Natural rubber ("latex"). Neoprene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl chloride ("PVC" or "vinyl"). Examples of acceptable glove barrier materials include: Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl alcohol ("PVA"). Viton. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body

reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus. The following should be effective types of air-purifying respirators: Organic vapor cartridge.

Ingestion: Avoid ingestion of even very small amounts; do not consume or store food or tobacco in the work area; wash hands and face before smoking or eating.

Engineering Controls

Ventilation: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Appearance	
Physical State	Liquid.
Color	Colorless
Odor	Mild
Odor Threshold	No test data available
pH	No test data available
Melting Point	Not applicable to liquids
Freezing Point	-90 °C (-130 °F) *Literature*
Boiling Point (760 mmHg)	132 °C (270 °F) *Literature* .
Flash Point - Closed Cup	39 °C (102 °F) *ASTM D56*
Evaporation Rate (Butyl Acetate = 1)	0.43 *Literature*
Flammability (solid, gas)	Not applicable to liquids
Flammable Limits In Air	**Lower**: 1.0 %(V) *Literature* **Upper**: 5.5 %(V) *Literature*
Vapor Pressure	3.7 mmHg @ 20 °C *Literature*
Vapor Density (air = 1)	3.5 *Literature*
Specific Gravity (H2O = 1)	0.807 20 °C/20 °C *Literature*
Solubility in water (by weight)	1.7 % @ 20 °C *Literature*
Partition coefficient, n-octanol/water (log Pow)	1.43 *Measured*
Autoignition Temperature	1,013 hPa 335 °C (635 °F)
Decomposition Temperature	No test data available
Dynamic Viscosity	5.2 mPa.s @ 20 °C *Literature*
Kinematic Viscosity	6.4 mm2/s @ 20 °C *Literature*
Explosive properties	Not explosive
Oxidizing properties	No
Molecular Formula	(CH3)2CHCH2CH(OH)CH3
Henry's Law Constant (H)	4.45E-05 atm*m3/mole; 25 °C Measured

10. Stability and Reactivity

Reactivity

No dangerous reaction known under conditions of normal use.

Chemical stability

Thermally stable at recommended temperatures and pressures.

Possibility of hazardous reactions
Polymerization will not occur.

Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose.

Incompatible Materials: Avoid contact with: Acid chlorides. Acids. Oxidizers.

Hazardous decomposition products
Decomposition products depend upon temperature, air supply and the presence of other materials.

11. Toxicological Information

Acute Toxicity
Ingestion
LD50, rat 2,590 mg/kg
Dermal
LD50, rabbit 2,800 mg/kg
Inhalation
As product: The LC50 has not been determined.

Eye damage/eye irritation
May cause moderate eye irritation. May cause moderate corneal injury. Vapor may cause eye irritation experienced as mild discomfort and redness.

Skin corrosion/irritation
Prolonged contact may cause slight skin irritation with local redness. May cause drying and flaking of the skin.

Sensitization
Skin
No relevant data found.
Respiratory
No relevant data found.

Repeated Dose Toxicity
Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed. In animals, effects have been reported on the following organs: Kidney.

Chronic Toxicity and Carcinogenicity
For the minor component(s) Has caused cancer in some laboratory animals. However, the relevance of this to humans is unknown.
Carcinogenicity Classifications:

Component	List	Classification
Methyl isobutyl ketone	IARC	Possibly carcinogenic to humans.; 2B

Developmental Toxicity
No relevant data found.

Reproductive Toxicity
No relevant data found.

Genetic Toxicology
In vitro genetic toxicity studies were negative.

12. Ecological Information

Toxicity

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity
LC50, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 h: 359 mg/l
Aquatic Invertebrate Acute Toxicity
EC50, Daphnia magna (Water flea), semi-static test, 48 h, immobilization: 337 mg/l
Aquatic Plant Toxicity
EbC50, Pseudokirchneriella subcapitata (green algae), biomass growth inhibition, 96 h: 147 mg/l
ErC50, Pseudokirchneriella subcapitata (green algae), Growth rate inhibition, 96 h: 334 mg/l
Toxicity to Micro-organisms
EC50; Bacteria: > 1,000 mg/l

Persistence and Degradability

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
94 %	20 d	OECD 301A Test	pass

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
1.28E-11 cm3/s	10 h	Estimated.

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
38 - 50 %	67 - 72 %	67 - 94 %	

Chemical Oxygen Demand: 2.43 mg/mg
Theoretical Oxygen Demand: 2.82 mg/mg

Bioaccumulative potential
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient, n-octanol/water (log Pow): 1.43 Measured

Mobility in soil
Mobility in soil: Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient, soil organic carbon/water (Koc): 21 - 140 Estimated.
Henry's Law Constant (H): 4.45E-05 atm*m3/mole; 25 °C Measured
Distribution in Environment: Mackay Level 1 Fugacity Model:

Air	Water.	Biota	Soil	Sediment
54.6 %	45.2 %	0 %	0.1 %	0.1 %

13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

14. Transport Information

DOT Non-Bulk
Proper Shipping Name: METHYL ISOBUTYL CARBINOL
Hazard Class: 3 **ID Number:** UN2053 **Packing Group:** PG III

DOT Bulk
Proper Shipping Name: METHYL ISOBUTYL CARBINOL
Hazard Class: 3 **ID Number:** UN2053 **Packing Group:** PG III

IMDG
Proper Shipping Name: METHYL ISOBUTYL CARBINOL
Hazard Class: 3 **ID Number:** UN2053 **Packing Group:** PG III
EMS Number: F-E,S-D
Marine pollutant.: No

ICAO/IATA
Proper Shipping Name: METHYL ISOBUTYL CARBINOL
Hazard Class: 3 **ID Number:** UN2053 **Packing Group:** PG III
Cargo Packing Instruction: 366
Passenger Packing Instruction: 355

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	Yes
Fire Hazard	Yes
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
This product contains the following substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and which are listed in 40 CFR 372.

Component	CAS #	Amount
Methyl isobutyl ketone	108-10-1	< 1.0 %

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:
The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Methylisobutylcarbinol	108-11-2	> 98.0 %
2,6-Dimethyl-4-heptanone	108-83-8	< 2.0 %

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)
WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

Component	CAS #	Amount
Methyl isobutyl ketone	108-10-1	< 1.0 %

European Inventory of Existing Commercial Chemical Substances (EINECS)
The components of this product are on the EINECS inventory or are exempt from inventory requirements.
US. Toxic Substances Control Act
All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30
CEPA - Domestic Substances List (DSL)
All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

16. Other Information

Hazard Rating System

NFPA	Health	Fire	Reactivity
	1	2	0

Recommended Uses and Restrictions
Identified uses
Chemical additive. Chemical intermediate. Frothing agent.

Revision
Identification Number: 1298 / 1001 / Issue Date 08/20/2012 / Version: 6.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

The Dow Chemical Company urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with

all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

MSDS Date: October 28, 2010
Emergency Contact: 1-800-424-9300

SECTION I

PRODUCT NAME: Sodium Silicate
FORMULA: Na_2SiO_3

DOT SHIPPING INFORMATION: Not Regulated

SECTION II - HAZARDOUS INGREDIENTS

This material contains no ingredients which are known by Thatcher Company to be hazardous unless listed below.

HAZARDOUS MATERIAL	CAS NUMBER	w/w %	EXPOSURE LIMITS IN AIR
Sodium Silicate	1344-09-8	35-40%	Amorphous silica, including natural diatomaceous earth: OSHA PEL 80 $mg/m^3/\%SiO_2$

The specific identity of some ingredients may be withheld for confidential business purposes. However, all known potential health effects from exposure to these ingredients are being addressed.

SECTION III - HEALTH HAZARD DATA

NFPA HAZARD RATING

Health = N/A
Flammability = N/A
Reactivity = N/A

Carcinogenic Listing:

NTP: No Ingredients are listed in this section.

IARC MONOGRAPHS: No Ingredients are listed in this section.

OSHA 29 CFR 1910: No Ingredients are listed in this section.

ENTRY ROUTES & EFFECTS OF OVEREXPOSURE:

Contact Skin: A strong alkaline irritant. Causes severe irritation. Symptoms include redness, itching and pain. Dries to form a glass film which can cut skin. Solid sodium silicate: Dermal contact with alkaline corrosives may produce pain, redness, severe irritation or full thickness burns.

Eyes: A strong alkaline irritant. Alkaline eye exposures produce severe irritation with effects similar to those of dilute caustics. Inflammation or burns with possible damage to the eye tissues can occur together with tearing and considerable pain.

Inhalation A strong alkaline irritant. Inhalation can cause severe irritation of mucous membranes and upper respiratory tract. Symptoms may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting. High concentrations may cause lung damage.

Ingestion A strong alkaline irritant. Causes irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea. Solid sodium silicate: Alkaline corrosive ingestion may produce burns to the lips, tongue, oral mucosa, upper airway, esophagus and occasionally stomach.

STATEMENT OF PRACTICAL TREATMENT:

Contact Skin: Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Inhalation Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

SECTION IV - FIRE AND EXPLOSION DATA

FLASH POINT:
Not considered to be a fire hazard.

EXPLOSION:
Not considered to be an explosion hazard.

FLAMMABLE LIMITS:
UEL: N/A
LEL: N/A

EXTINGUISHING MEDIA:
Use any means suitable for extinguishing surrounding fire.

SPECIAL FIRE-FIGHTING PROCEDURES:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

SECTION V - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

If the exposure limit is exceeded, a half-face dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

VENTILATION:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

EYE PROTECTION:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

SKIN PROTECTION:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

SECTION VI - SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS:

Incompatible with Fluorine, mineral acids, organic acids, organic materials. May produce hydrogen gas on prolonged contact with metals. Gels when mixed with acids. Solution is a strong base; reacts with acids, organic anhydrides, alkylene oxides, epichlorohydrin, aldehydes, alcohols, glycols, phenols, cresols, caprolactam solution. Attacks chemically active metals.

SECTION VII - PHYSICAL DATA

MELTING POINT C (F):	N/D	BOILING POINT C (F):	Approx 102 C (216 F)
DENSITY:	1.3-1.5	VAPOR PRESSURE (mmHg):	18 (20C)
pH:	10-11	EVAPORATION RATE:	N/D
APPEARANCE AND ODOR:	Clear to cloudy, viscous liquid with no odor.		

SECTION VIII - REACTIVITY DATA

STABILITY:

Product is expected to be stable.

HAZARDOUS POLYMERIZATION:

Not expected to occur.

CONDITIONS OR MATERIALS TO AVOID:

Incompatible with Fluorine, mineral acids, organic acids, organic materials. May produce hydrogen gas on prolonged contact with metals. Gels when mixed with acids. Solution is a strong base; reacts with acids, organic anhydrides, alkylene oxides, epichlorohydrin, aldehydes, alcohols, glycols, phenols, cresols, caprolactam solution. Attacks chemically active metals.

HAZARDOUS DECOMPOSITION PRODUCTS:

None.

SECTION IX - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL SPILLS OR LEAKS:

Caution! Floor and other surfaces may be slippery. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer!

WASTE DISPOSAL METHOD:

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

ACGIH = American Conference of Governmental Industrial Hygienists
CL = Ceiling Level
IARC = International Agency for Research on Cancer: Monographs
OSHA = Occupational Safety and Health Administration
N/D = Not Determined
N/A = Not Applicable
NTP = National Toxicology Program: Annual Report on Carcinogens
PEL = Permissible Exposure Level (OSHA)
TLV = Threshold Limit Value (ACGIH)
TWA = Time Weighted Average over 8 Hours

This information is, to the best of our knowledge, accurate but may not be complete. THATCHER COMPANY furnishes this information in good faith, but without warranty, representation or guarantee of its accuracy, completeness, or reliability.

PROSPEC CHEMICALS
P.O. BOX 3478
176 STURGEON DRIVE
STURGEON COUNTY; ALBERTA; T8L 2T4
CANADA

PRODUCT: TENNAFROTH 250

Section 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURERS.....	PROSPEC CHEMICALS P.O. BOX 3478 176 STURGEON DRIVE STURGEON COUNTY, ALBERTA T8L 2T4 (780) 992-1522
PRODUCT NAME	TENNAFROTH 250
CHEMICAL NAME:.....	ALKYL POLYGLYCOL ETHER.
MATERIAL USE:.....	MINING CHEMICALS.
CHEMICAL FAMILY:.....	ALCOHOL.
CHEMICAL FORMULA:.....	NOT APPLICABLE.
MOLECULAR WEIGHT:.....	NOT APPLICABLE.

Section 02: HAZARDS IDENTIFICATION

ROUTE OF ENTRY:

SKIN CONTACT:.....	MAY BE IRRITATING. SEVERE OVEREXPOSURE CAN BE FATAL.
SKIN ABSORPTION:.....	NOT AVAILABLE.
EYE	CAUSES EYE IRRITATION.
INHALATION	CAN CAUSE RESPIRATORY IRRITATION IF INHALED.
INHALATION CHRONIC:.....	NOT AVAILABLE.
INGESTION:.....	CAN CAUSE IRRITATIONS OF MUCOUS MEMBRANE.
EFFECTS OF ACUTE EXPOSURE:.....	REFER TO ROUTE OF ENTRY.
EFFECTS OF CHRONIC EXPOSURE:.....	PERSONS WITH IMPAIRED RESPIRATORY FUNCTION MAY BE MORE SENSITIVE. PENTANOL IS A CNS DEPRESSANT. HIGH EXPOSURES MAY CAUSE DIZZINESS, CONFUSION, NAUSEA, UNCONSCIOUSNESS. VERY HIGH EXPOSURES MAY BE FATAL.

Section 03: COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredients	%	Exposure Limit	C.A.S.#	LD/50, Route,Species	LC/50 Route,Species
POLYPROPYLENE GLYCOL METHYL ETHER	60-100	NOT AVAILABLE	37286-64-9	ORAL RAT 1200-2500 mg/kg	NOT AVAILABLE
DIPROPYLENE GLYCOL MONOMETHYL ETHER	10-30	NOT AVAILABLE	34590-94-8	ORAL RAT 5430 MG/KG	NOT AVAILABLE
PROPYLENE GLYCOL MONOMETHYL ETHER	10-30	NOT AVAILABLE	107-98-2	ORAL RAT 6000 MG/KG	NOT AVAILABLE

Section 04: FIRST AID MEASURES

SKIN:.....	REMOVE ALL CONTAMINATED CLOTHING. WASH SKIN AREAS FOR 20 MINUTES OR UNTIL CHEMICAL IS REMOVED WITH SOAP AND WATER. DO NOT USE SOLVENTS. LAUNDER CLOTHES BEFORE RE-USE.
EYE:.....	FLUSH CONTINUOUSLY WITH WATER FOR 15 MINUTES. FORCIBLY HOLD EYELIDS APART TO ENSURE IRRIGATION OF ALL EYE TISSUE. IF IRRITATION PERSISTS GET MEDICAL ATTENTION.
INHALATION:.....	REMOVE TO FRESH AIR, APPLY ARTIFICIAL RESPIRATION OR ADMINISTER OXYGEN IF NECESSARY. SEEK PROMPT MEDICAL ATTENTION.
INGESTION:.....	DO NOT INDUCE VOMITING. LOOSEN TIGHT CLOTHING. IF INGESTION OF A LARGE AMOUNT DOES OCCUR SEEK MEDICAL ATTENTION.
NOTES TO PHYSICIAN:.....	SUPPORT RESPIRATORY AND CARDIOVASCULAR FUNCTION.
GENERAL ADVICE:.....	AVOID HIGH VAPOUR CONCENTRATIONS, USE WITH ADEQUATE VENTILATION. PRECAUTIONS SHOULD ALWAYS BE TAKEN TO AVOID SKIN/EYE CONTACT WITH ANY CHEMICAL SUBSTANCE.

PRODUCT: TENNAFROTH 250

Section 05: FIRE FIGHTING MEASURES

FLAMMABLE LIMITS IN AIR.....	NOT AVAILABLE.
IF YES, UNDER WHICH CONDITIONS?	
MEANS OF EXTINCTION:.....	WATER SPRAY. WATER FOG. DRY CHEMICAL.
SPECIAL PROCEDURES:.....	VAPOURS MAY TRAVEL TO SOURCE OF IGNITION AND FLASH BACK. MAY FORM EXPLOSIVE MIXTURE WITH AIR. SELF-CONTAINED, POSITIVE PRESSURE BREATHING APPARATUS AND PROPER PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING ANY CHEMICAL SUBSTANCE.
FLASH POINT, F, COC.....	95 CLOSED CUP.
AUTO IGNITION TEMPERATURE °C:.....	NOT APPLICABLE.
T.D.G. FLAMMABLE CLASS:.....	NOT APPLICABLE.
UPPER EXPLOSION LIMIT:.....	10.9% PROPYLENE GLYCOL MONOMETHYL ETHER.
LOWER EXPLOSION LIMIT:.....	1.5%.
HAZARDOUS COMBUSTION PRODUCTS..	NOT APPLICABLE.
EXPLOSION DATA:	
SENSITIVITY TO STATIC DISCHARGE:.....	NOT AVAILABLE.
SENSITIVITY TO IMPACT:.....	NONE IDENTIFIED.
RATE OF BURNING:.....	NOT AVAILABLE.
EXPLOSIVE POWER:.....	NOT AVAILABLE.

Section 06: ACCIDENTAL RELEASE MEASURES

CLEAN-UP PROCEDURES, LEAK/SPILL:...	ABSORB WITH INERT DRY MATERIAL. SWEEP UP. PUT INTO AN APPROVED METAL SALVAGE DRUM FOR DISPOSAL. DO NOT FLUSH TO SEWER.

Section 07: HANDLING AND STORAGE

STORAGE NEEDS:.....	STORE IN A DRY AND WELL-VENTILATED AREA.
HANDLING PROCEDURES AND EQUIPMENT:	AVOID ALL SKIN CONTACT. AVOID CONTACT WITH EYES.
SPECIAL SHIPPING INSTRUCTIONS.....	PROTECT AGAINST PHYSICAL DAMAGE. USE PRECAUTION WHEN HANDLING OR SHIPPING ANY CHEMICAL SUBSTANCE. CHECK DOCUMENTATION, BE SURE PROPER SAFETY MARKS HAVE BEEN APPLIED TO ALL CONTAINERS. (WHERE APPLICABLE).

Section 08: EXPOSURE CONTROLS/PERSONAL PROTECTION

PROTECTIVE EQUIPMENT:	
GLOVES/TYPE:.....	WEAR NEOPRENE GLOVES IF DIRECT CONTACT IS LIKELY.
RESPIRATOR/TYPE:.....	WHERE VAPOURS OR MIST ARE PRESENT, USE AN APPROVED NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR THE INDICATED COMPONENTS, OR USE AN APPROVED AIR SUPPLIED RESPIRATOR.
EYE/TYPE:.....	SAFETY GLASSES WITH SIDE-SHIELDS.
FOOTWEAR/TYPE:.....	SAFETY BOOTS.
CLOTHING/TYPE:.....	WEAR ADEQUATE PROTECTIVE CLOTHES.
OTHER/TYPE:.....	AN EYE WASH STATION AND SAFETY SHOWER SHOULD BE NEAR THE WORK AREA.
ENGINEERING CONTROLS:.....	PROVIDE ADEQUATE GENERAL AND LOCAL EXHAUST VENTILATION.

Section 09: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:.....	LIQUID.
ODOUR/APPEARANCE:.....	CLEAR AMBER.
ODOUR THRESHOLD:.....	NOT AVAILABLE.
VAPOUR PRESSURE:.....	0.08mm Hg.
REL. VAPOUR DENSITY.....	5.1.
% VOLATILE:	
BY VOLUME.....	5%.
BY WEIGHT	
EVAPORATION RATE:.....	NOT AVAILABLE.
BOILING POINT °C:.....	> 100.
FREEZING POINT °C:.....	NOT APPLICABLE.
pH:.....	10.5 +/- 0.5.
SPECIFIC GRAVITY:.....	0.98.
SOLUBILITY IN WATER (20 °C):.....	EASILY SOLUBLE IN COLD WATER.
COEFFICIENT WATER/OIL DIST.:.....	NOT AVAILABLE.

PRODUCT: TENNAFROTH 250

Section 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY:	
YES.....	YES.
NO, WHICH CONDITIONS?	
COMPATIBILITY WITH OTHER SUBSTANCES:	
YES.....	NOT AVAILABLE.
NO, WHICH ONES?	
REACTS VIOLENTLY WITH.....	NOT AVAILABLE.
DECOMPOSITION:.....	NOT AVAILABLE.

Section 11: TOXICOLOGICAL INFORMATION

ACUTE ORAL TOXICITY.....	SEE SECTION 3, HAZARDOUS INGREDIENTS.
LC 50 OF MATERIAL, SPECIES & ROUTE:.	NOT AVAILABLE.
EXPOSURE LIMIT OF MATERIAL:.....	PROPYLENE GLYCOL MONOMETHYL ETHER: TWA 100 STEL:150 PPM.
IRRITANCY OF MATERIAL:.....	IRRITANT. REFER TO ROUTE OF ENTRY, SECTION 3.
SENSITIZING CAPABILITY OF MATERIAL:	NOT AVAILABLE.
CARCINOGENICITY OF MATERIAL:.....	NOT AVAILABLE.
REPRODUCTIVE EFFECTS:	
REPRODUCTIVE TOXICITY:.....	NOT AVAILABLE.
MUTAGENICITY:.....	NOT AVAILABLE.
TERATOGENICITY & EMBRYOTOXICITY:..	NOT AVAILABLE.
SYNERGISTIC MATERIALS:.....	NOT AVAILABLE.
MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:	MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE TO THIS PRODUCT HAVE NOT BEEN ESTABLISHED. UNNECESSARY EXPOSURE TO THIS PRODUCT OR ANY OTHER CHEMICAL SHOULD BE AVOIDED.

Section 12: ECOLOGICAL INFORMATION

BIODEGRADABILITY.....	NOT AVAILABLE.
ENVIRONMENTAL.....	NOT AVAILABLE.

Section 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL, METHOD AND EQUIPMENT:	ALL WASTE FROM THIS PRODUCT INCLUDING ALL EMPTY CONTAINERS MUST BE DISPOSED OF IN ACCORDANCE WITH MUNICIPAL, PROVINCIAL AND FEDERAL REGULATIONS.

Section 14: TRANSPORT INFORMATION

T.D.G. CLASSIFICATION:.....	NOT REGULATED.
T.D.G. SHIPPING NAME:.....	NOT REGULATED.
T.D.G. SHIPPING INFORMATION:.....	NOT APPLICABLE.

Section 15: REGULATORY INFORMATION

WHMIS CLASSIFICATION:.....	CLASS D DIV. 2 SUB. B.
CPR COMPLIANCE.....	THIS PRODUCT HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CPR AND THE MSDS CONTAINS ALL OF THE INFORMATION REQUIRED BY THE CPR.

Section 16: OTHER INFORMATION

MANUFACTURERS MSDS DATE:.....	APRIL 19, 2004.
MSDS REVISION DATE:.....	APRIL 16, 2013.
NOTE:.....	The information on this Material Safety Data Sheet has been obtained from the manufacturer, and where applicable, from other reliable sources such as CCOHS and RTECS. However, CHARLES TENNANT & (COMPANY) CANADA LIMITED makes no warranties, expressed or implied, as to the accuracy, completeness or adequacy of the information contained herein, and shall not be held liable (regardless of fault) to anyone directly or indirectly for damages or injuries in the use of this product arising out of or in connection with the accuracy, completeness or adequacy of such information.
PREPARED BY	Regulatory Affairs
PREPARATION DATE	Apr16/13

SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **MOBILGREASE XHP 681 MINE**
Product Description: Base Oil and Additives
Product Code: 2015A0205090, 531301-00
Intended Use: Grease

COMPANY IDENTIFICATION

Supplier: **AMPOL AUSTRALIA PTY LTD**
ABN 17 000 032 128
2 Market Street
Sydney
New South Wales 2000 Australia

24 Hour Emergency Telephone	1800 033 111
Product Technical Information	1300364169
Supplier General Contact	+612 9250-5000
FAX	+612 9250-5742

SECTION 2 HAZARDS IDENTIFICATION

This material is not hazardous according to regulatory guidelines (see (M)SDS Section 15).

Contains: NAPHTHENIC ACIDS, ZINC SALTS May produce an allergic reaction.

Other hazard information:

Physical / Chemical Hazards:
No significant hazards.

Health Hazards:
High-pressure injection under skin may cause serious damage. Excessive exposure may result in eye, skin, or respiratory irritation.

Environmental Hazards:
No significant hazards.

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert

advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is defined as a mixture.

Hazardous Substance(s) or Complex Substance(s) required for disclosure

Name	CAS#	Concentration*	GHS Hazard Codes
ASPHALT (PETROLEUM)	8052-42-4	5 - < 10%	None
BENZENAMINE, N-PHENYL-, REACTION PRODUCTS WITH 2,4,4-TRIMETHYLPENTENE	68411-46-1	1 - < 5%	H316, H402, H412
CARBONIC ACID, CALCIUM SALT (1:1)	471-34-1	1 - < 5%	None
MOLYBDENUM (IV) SULPHIDE	1317-33-5	5 - < 10%	None
NAPHTHENIC ACIDS, ZINC SALTS	12001-85-3	0.1 - < 1%	H317, H319(2A), H401, H411
ZINC DIALKYL DITHIOPHOSPHATE	68457-79-4	1 - < 2.5%	H315, H318, H401, H411

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. Other ingredients determined not to be hazardous up to 100%.

SECTION 4 FIRST AID MEASURES

INHALATION
Under normal conditions of intended use, this material is not expected to be an inhalation hazard.

SKIN CONTACT
Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT
Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION
First aid is normally not required. Seek medical attention if discomfort occurs.

NOTE TO PHYSICIAN
None

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA
Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Aldehydes, Asphalt fumes, Incomplete combustion products, Oxides of carbon, Smoke, Fume, Sulphur oxides

FLAMMABILITY PROPERTIES

Flash Point [Method]: >246°C (475°F) [EST. FOR OIL, ASTM D-92 (COC)]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

PROTECTIVE MEASURES

Avoid contact with spilled material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

For emergency responders: Respiratory protection: respiratory protection will be necessary only in special cases, e.g., formation of mists. Half-face or full-face respirator with filter(s) for dust/organic vapor or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of spill and potential level of exposure. If the exposure cannot be completely characterized or an oxygen deficient atmosphere is possible or anticipated, SCBA is recommended. Work gloves that are resistant to hydrocarbons are recommended. Gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Chemical goggles are recommended if splashes or contact with eyes is possible. Small spills: normal antistatic work clothes are usually adequate. Large spills: full body suit of chemical resistant, antistatic material is recommended.

SPILL MANAGEMENT

Land Spill: Scrape up spilled material with shovels into a suitable container for recycle or disposal.

Water Spill: Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other shipping. Skim from surface

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is not a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Substance Name	Form	Limit/Standard			Note	Source
ASPHALT (PETROLEUM)	Fume.	TWA	5 mg/m3			Australia WES
ASPHALT (PETROLEUM) [benzene solubles]	Fume, inhalable	TWA	0.5 mg/m3			ACGIH
CARBONIC ACID, CALCIUM SALT (1:1)	Inhalable dust.	TWA	10 mg/m3			Australia WES
MOLYBDENUM (IV) SULPHIDE [as Mo]		TWA	10 mg/m3			Australia WES
MOLYBDENUM (IV) SULPHIDE [as Mo]	Inhalable fraction.	TWA	10 mg/m3			ACGIH
MOLYBDENUM (IV) SULPHIDE [as Mo]	Respirable fraction.	TWA	3 mg/m3			ACGIH

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

Biological limits

No biological limits allocated.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator

selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No protection is ordinarily required under normal conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

Nitrile,Viton

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Solid
Form: Semi-fluid
Colour: Grey
Odour: Characteristic
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.916
Flammability (Solid, Gas): N/A
Flash Point [Method]: >246°C (475°F) [EST. FOR OIL, ASTM D-92 (COC)]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D

Autoignition Temperature: N/D
Boiling Point / Range: > 316°C (600°F) [Estimated]
Decomposition Temperature: N/D
Vapour Density (Air = 1): N/D
Vapour Pressure: < 0.013 kPa (0.1 mm Hg) at 20 ºC [Estimated]
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5 [Estimated]
Solubility in Water: Negligible
Viscosity: 680 cSt (680 mm2/sec) at 40 ºC
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/D
DMSO Extract (mineral oil only), IP-346: < 3 %wt

NOTE: Most physical properties above are for the oil component in the material.

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

INCOMPATIBLE MATERIALS: Strong oxidisers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Negligible hazard at ambient/normal handling temperatures.
Ingestion	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin Corrosion/Irritation: No end point data for material.	Negligible irritation to skin at ambient temperatures. Based on assessment of the components.
Eye	
Serious Eye Damage/Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.

Sensitisation	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: No end point data for material.	Not expected to be a skin sensitizer. Based on assessment of the components.
Aspiration: Data available.	Not expected to be an aspiration hazard. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: No end point data for material.	Not expected to be a germ cell mutagen. Based on assessment of the components.
Carcinogenicity: No end point data for material.	Not expected to cause cancer. Based on assessment of the components.
Reproductive Toxicity: No end point data for material.	Not expected to be a reproductive toxicant. Based on assessment of the components.
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: No end point data for material.	Not expected to cause organ damage from prolonged or repeated exposure. Based on assessment of the components.

OTHER INFORMATION

For the product itself:

Component concentrations in this formulation would not be expected to cause skin sensitization, based on tests of the components, this formulation, or similar formulations.

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitising in test animals.

IARC Classification:

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = IARC 1 2 = IARC 2A 3 = IARC 2B

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data for the material, components of the material, or for similar materials, through the application of bridging principals.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:
Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL
Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS
Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (ADG) : Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

Marine Pollutant: No

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

This material is not considered hazardous according to Australia Model Work Health and Safety Regulations.

Product is not regulated according to Australian Dangerous Goods Code.

No Poison Schedule number allocated by the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) established under the Therapeutic Goods Act.

REGULATORY STATUS AND APPLICABLE LAWS AND REGULATIONS

Listed or exempt from listing/notification on the following chemical inventories (May contain substance(s) subject to notification to the EPA Active TSCA inventory prior to import to USA): AIIC,

DSL, ENCS, IECSC, ISHL, KECI, PICCS, TCSI, TSCA

SECTION 16 OTHER INFORMATION

KEY TO ABBREVIATIONS AND ACRONYMS:

N/D = Not determined, N/A = Not applicable, STEL = Short-Term Exposure Limit, TWA = Time-Weighted Average

KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):
H315: Causes skin irritation; Skin Corr/Irritation, Cat 2
H316: Causes mild skin irritation; Skin Corr/Irritation, Cat 3
H317: May cause allergic skin reaction; Skin Sensitisation, Cat 1
H318: Causes serious eye damage; Serious Eye Damage/Irr, Cat 1
H319(2A): Causes serious eye irritation; Serious Eye Damage/Irr, Cat 2A
H401: Toxic to aquatic life; Acute Env Tox, Cat 2
H402: Harmful to aquatic life; Acute Env Tox, Cat 3
H411: Toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 2

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Perkal Pty Ltd Trading as Statewide Oil (South Australia): Section 01: Supplier Mailing Address information was deleted.
Perkal Pty Ltd Trading as Statewide Oil (Western Australia): Section 01: Supplier Mailing Address information was deleted.
Southern Cross Lubes (Victoria and Tasmania, New South Wales and Australian Capital Territory): Section 01: Supplier Mailing Address information was deleted.
Composition: Component Table information was modified.
Section 01: Company Contact Methods information was modified.
Section 01: Company Mailing Address information was modified.
Section 16: HCode Key information was modified.

DGN: 7057931DAU (1010383)

Prepared by: Exxon Mobil Corporation
EMBSI, Clinton NJ USA
Contact Point: See Section 1 for Local Contact number

End of (M)SDS