

DIESEL

Material Safety Data Sheet

According to the Controlled Product Regulations

1. MATERIAL AND COMPANY IDENTIFICATION

Material Name : Shell ULS Diesel Extra B5
 Uses : Fuel for on-road diesel-powered engines.
 Product Code : 002D2152

Manufacturer/Supplier : Shell Canada Products
 400 - 4th Avenue S.W.
 Calgary AB T2P 0J4
 Canada

Telephone : (+1) 8006611600
 Fax : (+1) 4033848345

Emergency Telephone Number
 : Shell Canada: (+1) 800-661-7378
 CANUTEC (24 hr): (+1) 613-996-6666

2. COMPOSITION/INFORMATION ON INGREDIENTS

Mixture Description : Complex mixture of hydrocarbons consisting of paraffins, cycloparaffins, aromatic and olefinic hydrocarbons with carbon numbers predominantly in the C9 to C25 range. May also contain several additives at <0.1% v/v each. May contain cetane improver (Ethyl Hexyl Nitrate) at <0.2% v/v. May contain catalytically cracked oils in which polycyclic aromatic compounds, mainly 3-ring but some 4- to 6-ring species are present.
 Contains methyl and ethyl esters from lipid sources.

WHMIS Controlled Ingredients

Chemical Identity	CAS No.	Conc. W/W
Fuels, diesel	68334-30-5	< 100.00 %

Dyes and markers can be used to indicate tax status and prevent fraud.

Refer to Chapter 8 for Occupational Exposure Guidelines.

3. HAZARDS IDENTIFICATION

WHMIS Class/Description : Class B3 Combustible Liquid
 Class D2B Other Toxic Effects - Skin Irritant

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Health Hazards	: Class D2A Other Toxic Effects - Carcinogen Class D2B Other Toxic Effects - Blood, Thymus, Liver. : Limited evidence of carcinogenic effect. Harmful by inhalation. Slightly irritating to respiratory system. Irritating to skin.
Signs and Symptoms	: Harmful: may cause lung damage if swallowed. : If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath, and/or fever. The onset of respiratory symptoms may be delayed for several hours after exposure. Skin irritation signs and symptoms may include a burning sensation, redness, or swelling.
Safety Hazards	: Flammable. May ignite on surfaces at temperatures above auto-ignition temperature. Vapour in the headspace of tanks and containers may ignite and explode at temperatures exceeding auto-ignition temperature, where vapour concentrations are within the flammability range. Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire.
Environmental Hazards	: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Additional Information	: This product is intended for use in closed systems only.

4. FIRST AID MEASURES

Inhalation	: Remove to fresh air. If rapid recovery does not occur, transport to nearest medical facility for additional treatment.
Skin Contact	: Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes, and follow by washing with soap and water if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment. When using high pressure equipment, injection of product under the skin can occur. If high pressure injuries occur, the casualty should be sent immediately to a hospital. Do not wait for symptoms to develop.
Eye Contact	: Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.
Ingestion	: If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. If any of the following delayed signs and symptoms appear within the next 6 hours, transport to the nearest medical facility: fever greater than 101° F (38.3°C), shortness of breath, chest congestion or continued coughing or wheezing. Give nothing by mouth.
Advice to Physician	: Treat symptomatically.

5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

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Flash point	: > 40 °C / 104 °F (ASTM D-93 / PMCC)
Upper / lower Flammability or Explosion limits	: 1 - 6 %(V)
Auto ignition temperature	: > 220 °C / 428 °F
Hazardous Combustion Products and Specific Hazards	: Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide. Oxides of sulphur. Unidentified organic and inorganic compounds. Carbon monoxide may be evolved if incomplete combustion occurs. Will float and can be reignited on surface water. Flammable vapours may be present even at temperatures below the flash point.
Suitable Extinguishing Media	: Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable Extinguishing Media	: Do not use direct water jets on the burning product as they could cause a steam explosion and spread of the fire. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.
Protective Equipment for Firefighters	: Wear full protective clothing and self-contained breathing apparatus.
Additional Advice	: Keep adjacent containers cool by spraying with water.

6. ACCIDENTAL RELEASE MEASURES

Protective Measures	: Do not breathe fumes, vapour. Do not operate electrical equipment. Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area. Use appropriate containment (of product and fire fighting water) to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Attempt to disperse the vapour or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment.
Clean Up Methods	: For small liquid spills (< 1 drum), transfer by mechanical means to a labelled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely. For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely. Shovel into a suitable clearly marked container for disposal or reclamation in accordance with local regulations.
Additional Advice	: Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Local authorities

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should be advised if significant spillages cannot be contained. Maritime spillages should be dealt with using a Shipboard Oil Pollution Emergency Plan (SOPEP), as required by MARPOL Annex 1 Regulation 26.

7. HANDLING AND STORAGE

- General Precautions** : Avoid breathing vapours or contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material. Air-dry contaminated clothing in a well-ventilated area before laundering. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Prevent spillages. Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Never siphon by mouth. Contaminated leather articles including shoes cannot be decontaminated and should be destroyed to prevent reuse. For comprehensive advice on handling, product transfer, storage and tank cleaning refer to the product supplier. Maintenance and Fuelling Activities - Avoid inhalation of vapours and contact with skin.
- Handling** : Avoid inhaling vapour and/or mists. Avoid prolonged or repeated contact with skin. When using do not eat or drink. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. Earth all equipment. Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. The vapour is heavier than air, spreads along the ground and distant ignition is possible.
- Storage** : Drum and small container storage: Drums should be stacked to a maximum of 3 high. Use properly labelled and closeable containers. Tank storage: Tanks must be specifically designed for use with this product. Bulk storage tanks should be diked (bunded). Locate tanks away from heat and other sources of ignition. Must be stored in a diked (bunded) well-ventilated area, away from sunlight, ignition sources and other sources of heat. Vapours from tanks should not be released to atmosphere. Breathing losses during storage should be controlled by a suitable vapour treatment system. The vapour is heavier than air. Beware of accumulation in pits and confined spaces. Keep in a bunded area with a sealed (low permeability) floor, to provide containment against spillage. Prevent ingress of water.
- Product Transfer** : Avoid splash filling. Wait 2 minutes after tank filling (for tanks such as those on road tanker vehicles) before opening hatches or manholes. Wait 30 minutes after tank filling (for large storage tanks) before opening hatches or manholes. Keep containers closed when not in use. Do not use compressed air

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- for filling, discharging or handling. Contamination resulting from product transfer may give rise to light hydrocarbon vapour in the headspace of tanks that have previously contained gasoline. This vapour may explode if there is a source of ignition. Partly filled containers present a greater hazard than those that are full, therefore handling, transfer and sampling activities need special care.
- Recommended Materials** : For containers, or container linings use mild steel, stainless steel. Aluminium may also be used for applications where it does not present an unnecessary fire hazard. Examples of suitable materials are: high density polyethylene (HDPE) and Viton (FKM), which have been specifically tested for compatibility with this product. For container linings, use amine-adduct cured epoxy paint. For seals and gaskets use: graphite, PTFE, Viton A, Viton B.
- Unsuitable Materials** : Some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Examples of materials to avoid are: natural rubber (NR), nitrile rubber (NBR), ethylene propylene rubber (EPDM), polymethyl methacrylate (PMMA), polystyrene, polyvinyl chloride (PVC), polyisobutylene. However, some may be suitable for glove materials.
- Container Advice** : Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.
- Additional Information** : Ensure that all local regulations regarding handling and storage facilities are followed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

If the American Conference of Governmental Industrial Hygienists (ACGIH) value is provided on this document, it is provided for information only.

Occupational Exposure Limits

Material	Source	Type	ppm	mg/m3	Notation
Fuels, diesel	ACGIH	TWA(Inhalable fraction and vapor.)		100 mg/m3	as total hydrocarbons
	ACGIH	SKIN_DES(Inhalable fraction and vapor.)			Can be absorbed through the skin.as total hydrocarbons

Consult local authorities for acceptable exposure limits within their jurisdiction.

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Biological Exposure Index (BEI) - See reference for full details

No biological limit allocated.

- Exposure Controls** : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Use sealed systems as far as possible. Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Local exhaust ventilation is recommended. Eye washes and showers for emergency use.
- Personal Protective Equipment** : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
- Respiratory Protection** : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. All respiratory protection equipment and use must be in accordance with local regulations.
- Hand Protection** : Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced.
- Eye Protection** : Chemical splash goggles (chemical monogoggles).
- Protective Clothing** : Chemical resistant gloves/gauntlets, boots, and apron (where risk of splashing).
- Monitoring Methods** : Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
- Environmental Exposure Controls** : Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance** : Yellow. Pale straw. Colourless. Liquid.
- Odour** : May contain a reodorant.
- Odour threshold** : Data not available

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pH	: Not applicable
Initial Boiling Point and Boiling Range	: 141 - 462 °C / 286 - 864 °F
Pour point	: <= 6 °C / 43 °F
Vapour pressure	: < 1 hPa at 20 °C / 68 °F
Specific gravity	: Data not available
Density	: < 0.900 g/cm ³ at 15 °C / 59 °F
Bulk density	: Data not available
n-octanol/water partition coefficient (log Pow)	: 3 - 6
Kinematic viscosity	: 2 - 4.5 mm ² /s at 40 °C / 104 °F
Vapour density (air=1)	: Data not available
Evaporation rate (nBuAc=1)	: Data not available

10. STABILITY AND REACTIVITY

Stability	: Stable under normal conditions of use.
Conditions to Avoid	: Avoid heat, sparks, open flames and other ignition sources.
Materials to Avoid	: Strong oxidising agents.
Hazardous Decomposition Products	: Hazardous decomposition products are not expected to form during normal storage. Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases, including carbon monoxide, carbon dioxide and other organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.
Hazardous Polymerisation	: No
Sensitivity to Mechanical Impact	: No
Sensitivity to Static Discharge	: No

11. TOXICOLOGICAL INFORMATION

Basis for Assessment	: Information given is based on product data, a knowledge of the components and the toxicology of similar products.
Acute Oral Toxicity	: Low toxicity: LD50 >2000 mg/kg , Rat. Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.
Acute Dermal Toxicity	: Low toxicity: LD50 >2000 mg/kg , Rabbit.
Acute Inhalation Toxicity	: Moderately toxic: LC50 >1- 5 mg/l , 4 h , Rat. High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.
Skin Irritation	: Irritating to skin.
Eye Irritation	: Expected to be slightly irritating.
Respiratory Irritation	: Inhalation of vapours or mists may cause irritation to the

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	respiratory system.
Sensitisation	: Not expected to be a skin sensitiser.
Repeated Dose Toxicity	: Causes damage to organs through prolonged or repeated exposure. Blood. Thymus. Liver.
Mutagenicity	: In-vitro mutagenicity studies show that mutagenic activity is related to 4-6 ring polycyclic aromatic content.
Carcinogenicity	: Limited evidence of carcinogenic effect. Repeated skin contact has resulted in irritation and skin cancer in animals.
Reproductive and Developmental Toxicity	: Not expected to impair fertility. Not expected to be a developmental toxicant.

12. ECOLOGICAL INFORMATION

Information given is based on a knowledge of the components and the ecotoxicology of similar products. Fuels are typically made from blending several refinery streams. Ecotoxicological studies have been carried out on a variety of hydrocarbon blends and streams but not those containing additives.

Acute Toxicity	: Toxic:LL/EL/IL50 1-10 mg/l(to aquatic organisms)(LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract.)
Chronic Toxicity	
Fish	: NOEC/NOEL expected to be > 0.01 - <= 0.1 mg/l (based on modeled data)
Aquatic Invertebrates	: NOEC/NOEL expected to be > 0.1 - <= 1.0 mg/l (based on modeled data)
Mobility	: Floats on water. Partly evaporates from water or soil surfaces, but a significant proportion will remain after one day. Large volumes may penetrate soil and could contaminate groundwater. Contains volatile constituents.
Persistence/degradability	: Major constituents are inherently biodegradable. The volatile constituents will oxidize rapidly by photochemical reactions in air.
Bioaccumulation	: Contains constituents with the potential to bioaccumulate.
Other Adverse Effects	: Films formed on water may affect oxygen transfer and damage organisms.

13. DISPOSAL CONSIDERATIONS

Material Disposal	: Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses. Do not dispose of tank water bottoms by allowing them to drain into the ground. This will result in soil and groundwater contamination. Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a
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- Container Disposal** : recognised collector or contractor. The competence of the collector or contractor should be established beforehand. Send to drum recoverer or metal reclaimer. Drain container thoroughly. After draining, vent in a safe place away from sparks and fire. Residues may cause an explosion hazard if heated above the flash point. Do not puncture, cut or weld uncleaned drums. Do not pollute the soil, water or environment with the waste container. Comply with any local recovery or waste disposal regulations.
- Local Legislation** : Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied with.

14. TRANSPORT INFORMATION**Canadian Road and Rail Shipping Classification**

UN/NA Number	UN 1202
Proper shipping name	DIESEL FUEL
Class Division	3
Packing group	III
Shipping Description	DIESEL FUEL, Class 3, UN 1202, PG III

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

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.

- WHMIS Class/Description** : Class B3 Combustible Liquid
 Class D2B Other Toxic Effects - Skin Irritant
 Class D2A Other Toxic Effects - Carcinogen
 Class D2B Other Toxic Effects - Blood, Thymus, Liver.

16. OTHER INFORMATION

- Additional Information** : This document contains important information to ensure the safe storage, handling and use of this product. The information in this document should be brought to the attention of the person in your organisation responsible for advising on safety matters.
- MSDS Version Number** : 1.1
- MSDS Effective Date** : 01-04-2012
- MSDS Revisions** : A vertical bar (|) in the left margin indicates an amendment from the previous version.
- MSDS Regulation** : The content and format of this (M)SDS is in accordance with

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- the Controlled Product Regulations.
- MSDS Prepared By** : Shell Product Stewardship; 1-800-661-1600
- Uses and Restrictions** : This product must not be used in applications other than those recommended in Section 1, without first seeking the advice of the supplier. This product is not to be used as a solvent or cleaning agent; for lighting or brightening fires; as a skin cleanser.
- MSDS Distribution** : The information in this document should be made available to all who may handle the product.
- Disclaimer** : The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.

DUST OFF



Material Safety Data Sheet

"Dymel" 152a

("DYMEL" is a registered trademark of DuPont)

1. Chemical Product and Company Identification

Product Trade Name: DUST-OFF® DUSTER



Chemical Family: Ethane, 1,1-Difluoro
FSP Model No: DPS, DPSCN, DPSX, DPSR, DPSRCN, DPSRX, DPSXL, DPSXLCN, DPSXLCN2, DPSXLX, DSXLP, DPSXL3, DPSJB, DPSJB2, DPSJBCN, DPSJC, DPSJCCN, DPSJBX, DPSMB, DPMSW, DPSJMB, DPSJMBCN, DPSJMB2, DPSXL12, DSXLPW, DCPJB, DCPJBCN, FGS, FGSCN, FGSRCN, FGSR.

Chemical Manufacturer: Dupont
Address: 1007 Market Street
Wilmington, DE 19898 USA
Phone: 1-800-441-7515
Product Manufacturer: Falcon Safety Products, Inc.
Address: 25 Imclone Drive
Branchburg, NJ 08876
Phone: 1-908-707-4900

Emergency Telephone USA: (800) 498-7192

2. Composition/Information on Ingredients

Chemical Name	Wt.%Range	TLV Units
1,1-Difluoroethane	100%	
CAS #75-37-6		

3. Hazard Identification

Potential Health Effects:

Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness, or death. Intentional misuse or deliberate inhalation may cause death without warning. Vapor reduces oxygen available for breathing and is heavier than air. Liquid contact can cause frostbite.

Human Health Effects:

Higher exposures may lead to irritation of nose, throat, and lungs with cough, difficulty breathing or shortness of breath, temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation, or abnormal kidney function as detected by laboratory tests. Gross overexposure may be fatal.

Medical Conditions Aggravated by Exposure:

Individual with preexisting diseases of the central nervous, cardiovascular system, lungs, or kidneys may have increased susceptibility to the toxicity of excessive exposures.

Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

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4. First Aid Measures

- Inhalation:** If high concentrations are inhaled, immediately remove to fresh air. Keep person calm. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
- Skin Contact:** Promptly flush skin with water until all chemical is removed. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Get medical attention if symptoms persist.
- Eye Contact:** Immediately flush eyes with large amounts of water for at least 15 minutes (in case of frostbite water should be lukewarm, not hot) lifting eyelids occasionally to facilitate irrigation. Get medical attention if symptoms persist.
- Ingestion:** Ingestion is not considered a potential route of exposure.

Notes to Physicians:

Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution only in situations of emergency life support.

5. Firefighting Measures

- Flash Point:** <-50°C (<-58°F)
- Auto Ignition Temperature:** 454°C (849°F)
- Flammable Limits in Air:** LEL/UEL: 3.9-16.9 (% by volume)
- Fire and Explosion Hazards:** Aerosol cans may erupt with force at temperatures above 49° C (120° F) HFC 152a fire decomposition by-products will include hydrofluoric acid, and possibly carbonyl fluoride. Avoid contact with these materials, which are toxic and irritating. Evacuate personnel immediately in the event of a fire involving HFC-152a.
- Extinguishing Media:** Water Spray, Water fog, Dry Chemical, Carbon dioxide. "Alcohol" foam.

Special Firefighting Procedures:

Cool cans with water spray. If gas exiting can ignites, stop flow of gas. Do not put out fire unless leak can be stopped. Self-contained breathing apparatus (SCBA) is required if containers rupture and contents are released under fire conditions.

National Fire Protection Association (NFPA 308)

Level 1 Aerosols (lowest flammability rating)

6. Accidental Release Measures

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

- Spill or Leak:** Although the chances of a large spill or leak are unlikely in aerosol containers. If a spill can cause a concentration in excess of 1,000 ppm, stop flow and remove ignition sources. Evacuate area. Ventilate area, especially low places where heavy vapors might collect. Wear self-contained breathing apparatus (SCBA).

If this product is spilled and not recovered, or is recovered as a waste for treatment or disposal, the CERCLA Reportable Quantity is 100 lbs. (Release of an unlisted Hazardous Waste characteristic of ignitability).

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7. Handling and Storage

Avoid breathing vapors or mist. Keep containers closed. Use only with adequate ventilation. Avoid repeated or prolonged contact with eyes, skin or clothing. Wash thoroughly after handling. Do not store in direct sunlight. Store in cool dry place, away from heat, sparks or flames which may generate toxic decomposition products. Vapors are heavy and may concentrate in low poorly ventilated areas.

8. Exposure Controls/Personal Protection

Engineering Controls: Ground all equipment and cylinders before use. Do not use near any spark producing electrical devices such as paper shredders.

Respiratory Protection: Use only with adequate ventilation. Keep container closed. Use approved NIOSH self-contained or supplied air respirators for emergencies and in situations where air may be displaced by vapors.

Eye Protection: Use chemical protective safety glasses.

Protective Clothing: Where there is potential for skin contact, use appropriate impervious gloves, apron, pants and jacket.

Exposure Guidelines: Applicable Exposure Limits.

Difluoroethane:

PEL (OSHA)	None Established
TLV (ACGIH)	None Established
AEL (DuPont)	1000 ppm, 8 Hr. TWA
WEEL (AIHA)	1000 ppm, 8 Hr. TWA

NFPA, NPCA-NIMIS RATING:

Health	1		
	Flammability	4	
	Reactivity	1	

Personal Protection rating to be supplied by user depending on use conditions.

9. Physical and Chemical Properties

Physical Form:	Liquefied Gas
Odor:	Slight Ethereal
Boiling Point:	-25°C (-13°F)
pH:	Not Applicable
Solubility in Water:	0.28 WT% @ 25°C (77°F) and 87 psia.
Specific Gravity:	0.909
% Volatile by Weight:	100
Vapor Pressure:	87 psia at 25°C (77°F)
Density:	.90 g/cc at 25°C (77°F) - Liquid
Vapor Density (air=1):	2.4 (Air = 1.0) at 25°C (77°F)
Color:	Clear, colorless

10. Reactivity

Chemical Stability: Material is stable. However, avoid open flames and high temperatures.

Hazardous Polymerization: Will not occur.

Incompatibilities: Incompatible with alkali or alkaline earth metal –powdered Al, Zn, Be, etc.

Decomposition Products: Decomposition products are hazardous. This material can be decomposed by **high temperatures** forming hydrofluoric acid and possibly carbonyl fluoride

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11. Toxicological Information

Animal Data:

Oral ALD: >1500 mg/kg in rats Inhalation ALC, 4 hr: 383,000 ppm in rats HFC-152a has not been tested for skin and eye irritancy, nor for animal sensitization. Ingestion of single high doses of HFC-152a caused weight loss and lethargy.

Carcinogenicity:

Inhalation of high levels of HFC-152a caused labored breathing, lung irritation, lethargy, incoordination and loss of consciousness. Cardiac sensitization occurred in dogs exposed to a concentration of 150,000 ppm in air and given an intravenous epinephrine challenge. Repeated inhalation exposures caused increased urinary fluoride, reduced kidney weight, and reversible kidney changes. Based on an independent peer review the reversible kidney changes are considered artifacts of the tissue and slide processing and not a compound related effect. Animal testing demonstrate no carcinogenic activity nor developmental effects. No animal data are available to define reproductive effects of HFC-152a. HFC-152a has not produced genetic damage in bacterial cultures. There are reports indicating that HFC-152a produced genetic damage in some mammalian cell culture tests. A weak genotoxic effect in germ cells of *Drosophila melanogaster* has been reported. It has not been tested in animals.

12. Ecological Information

Aquatic Toxicity:

Not Available

13. Disposal Considerations

Waste Disposal: Reclaim by distillation, incinerate, or remove to a permitted waste facility. Comply with Federal, State, and local regulations.

This material may be a RCRA Hazardous waste upon disposal due to the ignitability characteristic.

14. Transportation Information

Transport for Aerosol Packaging:

Shipping Information
DOT/IMO
Proper Shipping Name : 1,1-DIFLUOROETHANE
Hazard Class : 2.1
UN No. : 1030
DOT/IMO Label : FLAMMABLE GAS
Special Information : CARGO AIRCRAFT ONLY

NOTE: Falcon Safety Products has been granted a DOT exemption that allows this product to be shipped similar to a Consumer Commodity (ORM-D). A copy of the DOT exemption can be obtained by calling Falcon Safety Products, Inc at 908-707-4900.

15. Regulatory Information

U.S. Federal Regulations

TSCA Inventory Status : Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes
Chronic : No
Fire : Yes
Reactivity : No

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Regulatory Information continued.....

Pressure : Yes

LISTS:

SARA Extremely Hazardous Substance -No

CERCLA Hazardous Substance -(*)

SARA Toxic Chemicals -No

*See Disposal Information

"DYMEL" 152a is a flammable gas as defined by OSHA in 29CFR 1910.1200(c). Use of this product may require compliance with 29CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals.

This information must be included in all MSDSs that are copied and distributed for this material.

California V.O.C. Data: This product contains 0 grams total VOC per liter.

16. Other Information

NFPA, NPCA-HMIS

NPCA-HMIS Rating

Health : 1

Flammability : 4

Reactivity : 1

WHIMIS - Canada

Class A - Compressed Gas

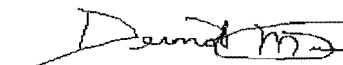
Class B-1 - Flammable Gas

CEPA DSL: difluoroethane

Personal Protection rating to be supplied by user depending on use

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Signature

Dermot McLeer

Printed Name

Technical Manager

Title

10/30/2006

Revision Date

**EXCALIBUR
VEHICLE
WASH**

MATERIAL SAFETY DATA SHEET

SECTION I - PRODUCT IDENTIFICATION AND PREPARATION INFORMATION

Product Name: EXCALIBUR 5100
Product Use: Vehicle Wash
WHMIS Class: Class D - Division 2A
T.D.G. Classification: Not Regulated

HEALTH	2
FLAMMABILITY	0
REACTIVITY	0
PERSONAL PROTECTION	B

Manufacturer Name and Address: Excalibur Industrial
1120 McDonald St.
Regina, SK S4N 4X3

Emergency Telephone: (306) 569-2781

SECTION II - HAZARDOUS INGREDIENTS

Ingredients	CAS No.	Wt%	ACGIH-TLV	LC ₅₀	LD ₅₀
Ethylenediaminetetracetic acid, tetrasodium salt	64-02-8	5-10	10 mg/m ³ TWA	Not available	3030 mg/kg oral, rat
Trisodium nitrilotriacetate	5064-31-3	1-5	10 mg/m ³ TWA	Not available	1100 mg/kg oral, rat
alcohol, C-10 ethoxylated	26183-52-8	1-5	Not available	Not available	

SECTION III - PHYSICAL DATA

Boiling Point (deg C): Not available
Vapour Pressure (mm Hg): Not available
Vapour Density (Air = 1): Not available
Solubility in Water: Complete
Physical State: Liquid
Appearance and Odour: Colourless with mild odour

Specific Gravity (H₂O = 1): 1.046
Evaporation Rate (H₂O = 1): Not available
pH (as supplied): 12.6
Viscosity: Water thin

SECTION IV - FIRE AND EXPLOSION DATA

Flammability: Not flammable by WHMIS criteria.
Flash Point (deg C, TCC): None
Hazardous Combustion Products: May include and are not limited to oxides of carbon, oxides of nitrogen.
Means of Extinction: Treat for surrounding material.
Special Fire Hazards: Firefighters should wear self-contained breathing apparatus.

SECTION V - REACTIVITY DATA

Conditions for Chemical Instability: Stable.
Incompatible Materials: Strong oxidizing agents.
Reactivity, and Under What Conditions: Not available.
Hazardous Decomposition Products: May include and are not limited to oxides of carbon, oxides of nitrogen when heated to decomposition.

=====

SECTION VI - TOXICOLOGICAL PROPERTIES

=====

Route of Entry: Eye, Skin contact, Inhalation, Ingestion

EFFECTS OF ACUTE EXPOSURE:

Eye: May cause severe irritation or chemical burns.

Skin: May cause severe irritation or chemical burns. Harmful contact may not cause immediate pain.

Inhalation (of mist): May cause respiratory tract irritation, coughing and headache.

Ingestion: May cause chemical burns to mouth, throat and stomach.

EFFECTS OF CHRONIC EXPOSURE:

Skin: Cause severe irritation with prolonged contact.

Irritancy: Hazardous by WHMIS criteria.

Respiratory Tract Sensitization: No data available

Carcinogenicity: Hazardous by WHMIS criteria (Trisodium nitrilotriacetate).

Teratogenicity, Mutagenicity, Reproductive Effects: No data available.

=====

SECTION VII- PREVENTATIVE MEASURES

=====

Gloves: Rubber. Confirm with reputable supplier first.

Eye Protection: Chemical splash goggles.

Respiratory Protection: Not normally required if good ventilation is maintained. Avoid breathing mists.

Other Protective Equipment: As required by employer code.

Engineering Controls: Ensure good ventilation.

Leak and Spill Procedure: Before attempting cleanup, refer to hazard data given above. Small spills may be absorbed with non-reactive absorbent and placed in suitable, covered, labelled containers. Prevent large spills from entering sewers or waterways. Contact emergency services and supplier for advice.

Waste Disposal: Review federal, provincial and local government requirements prior to disposal.

Storage and Handling Requirements: Store in closed container away from incompatible materials. Keep out of the reach of children.

=====

SECTION VIII - FIRST AID

=====

Eye: Immediately flush with water. Remove contact lenses, if applicable, and continue rinsing for 15 minutes. Obtain medical attention immediately.

Skin: Immediately flush with cool water for 15 minutes while removing contaminated clothing and shoes. Obtain medical attention if irritation persists. Discard or wash well before reuse.

Inhalation: Move victim to fresh air. If symptoms persist, obtain medical attention.

Ingestion: Do not induce vomiting. Rinse mouth with water, then drink one glass of water. Obtain medical attention immediately. Never give anything by mouth if victim is unconscious, is rapidly losing consciousness or is convulsing.

=====

SECTION IX - PREPARATION INFORMATION

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Date: 06/01/12

MSDS Prepared By: Excalibur Industrial

Phone Number: (306) 569-2781





Disclaimer

Information for this material safety data sheet was obtained from sources considered technically accurate and reliable. While every effort has been made to ensure full disclosure of product hazards, in some cases data is not available and is so stated. Since conditions of actual product use are beyond control of the supplier, it is assumed that users of this material have been fully trained according to the mandatory requirements of WHMIS. No warranty, expressed or implied, is made and supplier will not be liable for any losses, injuries or consequential damages which may result from the use of or reliance on any information contained in this form. If user requires independent information on ingredients in this or any other material, we recommend contact with the Canadian Centre for Occupational Health and Safety (CCOHS) in Hamilton, Ontario (1-800-263-8466) or CSST in Montreal, Quebec (514-873-3990).

**EXTENDED
LIFE RAD
50/50 PREMIX**



Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Personal protective equipment
 	Class D-1B: Material causing immediate and serious toxic effects (Toxic). Class D-2A: Material causing other toxic effects (Very toxic).	 

Section 1. Product and Company Identification

Product name / Trade name	Extend Life Rad 50/50 Premix	Associated Product's Item Code	
Synonym	Not available.	CAS #	Not available.
Chemical family	Not available.	Validation date	
Chemical formula	CH ₂ OHCH ₂ OH	Print date	
Manufacturer/Supplier	Recochem Inc. 850 Montee de Liesse Montreal, Quebec H4T 1P4 (514) 341-3550 www.recochem.com	In case of emergency	Recochem Inc. Communications and Regulatory Affairs Department (905) 878-5544
Material uses	Industrial applications: Coolant and antifreeze formulations.		

Section 2. Hazards identification

Emergency Overview	WARNING! MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. Harmful by inhalation. Do not breathe vapor or mist. Avoid contact with eyes, skin and clothing. May cause target organ damage, based on animal data. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use.
Potential Acute Health Effects	See section 11 for more detailed information on health effects and symptoms. Toxic by ingestion. May cause abdominal discomfort or pain, nausea, vomiting, dizziness, central nervous system effects and coma. Cardiac failure, pulmonary edema and severe kidney damage may develop. May cause mild eye irritation. May cause mild skin irritation. Unlikely to be inhaled because of physical characteristics, however, heated material may produce vapours, which may cause irritation to lungs if inhaled excessively. Inhalation, particularly of mist, may cause irritation of the nose and throat with headache. High vapour concentrations may produce nausea, vomiting, headache, dizziness and irregular eye movement.
Note to Physician	The signs and symptoms in ethylene glycol poisoning are those of metabolic acidosis, central nervous system depression and kidney injury. Clinical chemistry may reveal anion-gap metabolic acidosis and uremia. Treatment with ethanol to inhibit the metabolism of glycol to oxalate. Early administration of ethanol may counter the toxic effects of ethylene glycol (cardiopulmonary effects attributed to metabolic acidosis and renal damage). Hemodialysis or peritoneal dialysis have been of benefit. Pre-existing respiratory and skin disorders may be aggravated by over-exposure to this product. Treat symptomatically and supportively.

Continued on next page

Section 3. Composition, information on ingredients

Ca a

Name	CAS number	Conc. (% w/w)
Ethylene glycol	107-21-1	45 - 55

There are no 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.

Section 4. First aid measures

Eye contact	Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 20 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 20 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.
Notes to physician	See section 2 Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Section 5. Fire-fighting measures

Products of combustion	Decomposition products may include the following materials: carbon dioxide carbon monoxide
Fire-fighting media and instructions	Use an extinguishing agent suitable for the surrounding fire.
Fire Hazards	Emits acrid smoke and irritating fumes when heated to decomposition. May be combustible at high temperature.
Explosion Hazards	Not a product presenting risks of explosion.

Section 6. Accidental release measures

Small spill and leak	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
Large spill and leak	Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Continued on next page

Section 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 ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. 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 (see section 10) 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.

Section 8. Exposure controls/personal protection

Engineering controls	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.
Personal protection	<p>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</p> <p>Body 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.</p> <p>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.</p> <p>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. >8 hours (breakthrough time): nitrile rubber</p>

United States**Product name**

Ethylene glycol

Exposure limits

OSHA PEL 1989 (United States, 3/1989).

CEIL: 50 ppm

CEIL: 125 mg/m³

ACGIH TLV (United States, 1/2008).

C: 100 mg/m³ Form: Aerosol**Canada****Occupational exposure limits**

Ingredient	List name	TWA (8 hours)			STEL (15 mins)			Ceiling			Notations
		ppm	mg/m ³	Other	ppm	mg/m ³	Other	ppm	mg/m ³	Other	

Continued on next page

Ethylene glycol	US ACGIH 1/2008	-	-	-	-	-	-	-	-	100	-	[a]
	AB 6/2008	-	-	-	-	-	-	-	-	100	-	[b]
	BC 6/2008	-	-	-	-	100	-	-	-	-	-	[a]
	ON 6/2008	-	10	-	-	20	-	-	-	-	-	[c]
	QC 6/2008	-	-	-	50	-	-	-	-	100	-	[d]
		-	-	-	50	127	-	-	-	-	-	[e]

Form: [a]Aerosol [b]aerosol [c]Particulate [d]Vapour [e]vapour and mist

Section 9. Physical and chemical properties

Physical State and Appearance	Clear viscous liquid.	Odour	Odorless.
Molecular weight	Not available.	Taste	Sweet.
pH	7.8 to 8.5	Colour	Luminescent yellow.
Boiling/condensation point	129°C (264.2°F)	Volatility	Not available.
Melting/freezing point	-37°C (-34.6°F)	Evaporation rate	0.01 (Butyl acetate. = 1)
Relative density	1.06 to 1.09	Odour Threshold	25 ppm
Vapor pressure	0.008 kPa (0.06 mm Hg)	Viscosity	Dynamic: 21 mPa·s (21 cP)
Vapour Density	2.1 [Air = 1]	Solubility	Soluble in water, methanol, diethyl ether.
VOC content	103.7 % (w/w) [ISO 11890-1]	Other Properties	Not available.

The product is:	May be combustible at high temperature.
Auto-ignition temperature	Not available.
Flash point	Not applicable.
Flammable limits	Not available.
Fire hazards in the presence of various substances	Non-flammable in the presence of the following materials or conditions: open flames, sparks and static discharge, heat and shocks and mechanical impacts

Section 10. Stability and reactivity

Stability	The product is stable.
Conditions of instability	Not available.
Incompatibility with various substances	Reactive or incompatible with the following materials: oxidizing materials, acids and alkalis. Avoid contamination with reactive substances.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Continued on next page

Section 11. Toxicological Information**C. 1a****Acute toxicity**

Product/ingredient name	Result	Species	Dose	Exposure
Ethylene glycol	LC50 Inhalation Dusts and mists	Rat	2725 mg/m ³	4 hours
	LD50 Dermal	Rabbit	9500 mg/kg	-
	LD50 Dermal	Rabbit	9500 mg/kg	-
	LD50 Dermal	Rabbit	9530 uL/kg	-
	LD50 Intraperitoneal	Mouse	5614 mg/kg	-
	LD50 Intraperitoneal	Rat	5010 mg/kg	-
	LD50 Intravenous	Rat	3260 mg/kg	-
	LD50 Oral	Cat	1650 mg/kg	-
	LD50 Oral	Dog	5500 mg/kg	-
	LD50 Oral	Mouse	5500 mg/kg	-
	LD50 Oral	Rat	4000 mg/kg	-
	LD50 Oral	Rat	4700 mg/kg	-
	LD50 Oral	Rat	5000 mg/kg	-
	LD50 Subcutaneous	Rat	2800 mg/kg	-
	LD50 Unreported	Mouse	8050 mg/kg	-
	LD50 Unreported	Rabbit	5017 mg/kg	-
	LD50 Unreported	Rat	13 g/kg	-

Conclusion/Summary

(Ethylene glycol) The most common effects seen from ingestion of ethylene glycol are central nervous system (CNS) depression (muscular incoordination, lethargy, coma) and harmful effects on the kidneys including inflammation, degeneration, tissue death (necrosis), tubule dilation and oxalate crystal or stone deposition.

Chronic toxicity

Conclusion/Summary Not available.

Carcinogenicity

Conclusion/Summary Exposure can cause dermatitis.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Ethylene glycol	A4	-	-	-	-	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : (Ethylene Glycol) Embryotoxicity (late resorptions), fetotoxicity (reduced fetal body weight) and teratogenicity (external, soft tissue and skeletal defects) have been observed in rats and mice exposed to at high oral doses that caused no or minimal maternal toxicity. The US National Toxicology Program-Center for the Evaluation of Risks to Human Reproduction (NTP-CERHR) has also concluded that oral exposure to high doses of ethylene glycol causes developmental toxicity in rats and mice.

Reproductive Toxicity

Conclusion/Summary : Not available.

Continued on next page

Section 12. Ecological information

For accidental discharges into the environment, see Section 6: "Accidental Release Measures" for suggested instructions.

Ecotoxicity : This product shows a low bioaccumulation potential.

Canada**Aquatic ecotoxicity**

Product/ingredient name	Result	Species	Exposure
Ethylene glycol	Acute EC50 >100 mg/L	Daphnia	4 hours
	Acute EC50 >100 mg/L	Daphnia	4 hours
	Acute IC50 >100 mg/L	Algae	1 hours
	Acute IC50 >100 mg/L	Algae	1 hours
	Acute LC50 >100000 ug/L Marine water	Crustaceans - Crangon crangon - Adult	48 hours
	Acute LC50 6900000 to 8800000 ug/L Fresh water	Daphnia - Ceriodaphnia dubia - Neonate	48 hours
	Acute LC50 >100 mg/L	Fish	24 hours
	Acute LC50 >100 mg/L	Fish	24 hours
	Acute LC50 8050000 ug/L Fresh water	Fish - Pimephales promelas - <=7 days	96 hours
	Chronic NOEC 11610000 ug/L Fresh water	Daphnia - Ceriodaphnia dubia - <=24 hours	48 hours
	Chronic NOEC 6090000 ug/L Fresh water	Fish - Pimephales promelas - <=7 days	96 hours

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

Section 13. Disposal considerations

Waste information 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.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Continued on next page

Section 14. Transport information**C la TDG Classification**

Class _____ Not a TDG-controlled material.

Subsidiary class _____ -

Proper Shipping Name (Canada) TDG _____ Not applicable.

UN number _____ Not applicable.

Packing Group _____ Not applicable.

Special provisions _____ Not applicable.

No placard (handling and hazard label) required

IMDG Classification

Class _____ Not controlled under IMDG.

Subsidiary class _____ Not applicable.

Proper Shipping Name (IMDG) _____ Not applicable.

UN number _____ Not applicable.

Packing Group _____ Not applicable.

Marine pollutant _____ Not a pollutant.

Special provisions _____ Not applicable.

No placard (handling and hazard label) required

No placard (handling and hazard label) required

United States DOT (Classification)

Class _____ Class 9: Miscellaneous hazardous material.

Subsidiary class _____ -

Proper Shipping Name (United States) DOT _____ Environmentally hazardous substance, liquid, n.o.s. (Ethylene glycol based coolant)

UN number _____ UN 3082

Packing Group _____ III

Special provisions _____ In single containers of 5000 lbs capacity or less this product is exempt from DOT regulations (not regulated). Does not require label or placards.
Reportable Quantity (RQ)= 5000 lbs (2268 kg) (as ethylene glycol)
For bulk shipments equal to or greater than Reportable Quantity (RQ), please adhere to classification as outlined in DOT Classification section.

International Air Transport Association (IATA)

For air shipment classification and associated regulations, please refer to the latest edition of IATA Dangerous Goods Regulations.

Continued on next page

**Section 15. Regulatory information**

V IIS Classification (Canada) Class D-1B: Material causing immediate and serious toxic effects (Toxic).
Class D-2A: Material causing other toxic effects (Very toxic).

Canada Domestic Substances List (DSL) Status This product and/ or all of its components are on the DSL.



HCS Classification (U.S.A.) Target organ effects

U.S.A. Regulatory Lists This product and/ or all of its components are on the TSCA inventory list.

Hazardous Material Information System (U.S.A.)

Health	2
Flammability	0
Reactivity	0
Personal protection	B

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

**Section 16. Other information**

Validated and verified by Compliance and Technical Information Manager on ph.# 905-878-5544.

Printed

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.

MSDS are available at www.recochem.com

**EYEWASH
SOLUTION
(BUFFERED
EYELERT)**



North Safety Products
1515 Elmwood Road
Rockford, IL 61103
(815) 877-2531

Material Safety Data Sheet
May be used to comply with
OSHA's Hazard Communication Std.
29CFR 1910.1200 Standard must be
consulted for specific requirements

Just Add
Conney Eye Wash
25965
76
71
72
73
82

25965, 25982, 25970, 25971
25972, 25973

SECTION I

Product Name Buffered EyeLert	Synonyms Eye Wash
Manufacturer's Name North Safety Products	Emergency Telephone Number 815-877-2531
Address (Number, Street, City, State and Zip Code)	Telephone Number for Information 815-877-2531
1515 Elmwood Road	Date Prepared 6/6/97
Rockford, IL 61103	Prepared By Phillip L. Rives

SECTION II - Hazardous Ingredients/Identity Information

Component Name	CAS#	OSHA PEL	ACGIH TLV	%
Water	7732185 ✓	N/A	N/A	97.93
Sodium Chloride	7647145 ✓	N/A	N/A	0.39
Disodium EDTA, Dihydrate	6381-92-6 ✓	N/A	N/A	0.10
Monobasic Sodium Phosphate	10049-21-5 ✓	N/A	N/A	0.25
Dibasic Sodium Phosphate	7558-79-4 ✓	N/A	N/A	1.31
ozal Konium Chloride 50%	8001545 ✓	N/A	N/A	0.02
All ingredients are non-hazardous				

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point	100°	Specific Gravity (H ₂ O = 1)	1.0
Vapor Pressure (mm Hg.)	NE	Melting Point	< 0° C
Vapor Density (AIR=1)	NE	Evaporation Rate (Butyl Acetate = 1)	NE
Solubility in Water Completely Soluble			
Appearance and Odor Clear, colorless, nearly odorless liquid which foams when shaken.			

SECTION IV - Fire and Explosion Hazard Data

Flash Point (Method Used) N/A	Flammable Limits None	LEL N/A	UEL N/A
Extinguishing Media N/A			
Special Fire Fighting Procedures None			
Unusual Fire and Explosion Hazards None			

REGISTERED
MAR - 3 1998

N/A = Not Applicable

NE = Not Established

SECTION V - Reactivity Data

Product Name: Buffered EyeLert

Stability	Unstable		Conditions to Avoid None
	Stable	X	
Incompatibility (Materials to Avoid) None			
Hazardous Decomposition or Byproducts None			
Hazardous Polymerization	May Occur		Conditions to Avoid None
	Will Not Occur	X	

SECTION VI - Health Hazard Data

Route(s) of Entry	Inhalation?	Skin? X	Ingestion?
Health Hazards (Acute and Chronic) None			
Carcinogenicity:	NTP? No	ARC Monographs? No	OSHA Regulated? No
Signs and Symptoms of Exposure None			
Medical Conditions Generally Aggravated by Exposure None Known			
Emergency and First Aid Procedures None			

SECTION VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled	Soak up with absorbent material.
Waste Disposal Method	Consult Current Local, State and Federal Regulations
Precautions to Be Taken in Handling and Storing	None
Other Precautions	None

SECTION VIII - Control Measures

Respiratory Protection (Specify Type) N/A			
Ventilation	Local Exhaust	Special	
	Mechanical (General)	Other	
Protective Gloves	None	Eye Protection	None
Other Protective Clothing or Equipment None			
Work/Hygenic Practices None			

The information and recommendations set forth herein are taken from sources believed to be accurate as of the date hereof, however, North Safety Products makes no warranty with respect to the accuracy of the information or the suitability of the recommendations, and assumes no liability to any user thereof.

FAST ORANGE

PUMICE

LOTION

Permatex, Inc.
 10 Columbus Blvd.
 Hartford, CT 06106 USA
 Telephone: 1-87-Permatex
 (877) 376-2839
 Emergency: 800-255-3924
 International Emergency: 813-348-0585

Material Safety Data Sheet

1. PRODUCT IDENTIFICATION

Product Name: FAST ORANGE PUMICE LOTION 1GAL
Item No: 25219
Product Type: Waterless hand cleaner

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	Percent	ACGIH 8 Hr. TWA:	OSHA 8 Hr. TWA:
Water 7732-18-5	75-85	Not Listed	Not Listed
PUMICE 1332-09-8	5-15	10 mg/m ³ (inhal); 3 mg/m ³ (resp)	15 mg/m ³ (total); 5 mg/m ³ (resp)
D-Limonene 5989-27-5	5-15	Not Established	Not Established
ETHOXYLATED C11-C16 ALCOHOL 127036-24-2	1-10	Not Listed	Not Listed
SILICA, QUARTZ 14808-60-7	0.1-1.0	0.1 mg/m ³ TWA respirable	0.1 mg/m ³ TWA respirable

3. HAZARDS IDENTIFICATION

Toxicity: Oral LD50 greater than 5000 mg/kg. Primary irritation tests show that this product is not a primary irritant.
Primary Routes of Entry: Eye and skin contact, ingestion, inhalation.
Signs and Symptoms of Exposure: None under normal conditons of use.

Ingredients	Percent	NTP:	ACGIH Carcinogens	IARC:
D-Limonene 5989-27-5	5-15	male rat-clear evidence; female rat-no evidence; male mice-no evidence; female mice-no evidence		
SILICA, QUARTZ 14808-60-7	0.1-1.0	Known Carcinogen	Not known	Group 1; Vol. 68; 1997

Medical Conditions Recognized as Being Aggravated by Exposure: None known

4. FIRST AID MEASURES

Ingestion: If swallowed, seek medical advice immediately and show this container or label
Inhalation: Immediate medical attention is not required.
Skin Contact: none under normal use
Eye Contact: In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice

5. FIRE FIGHTING MEASURES

Flash Point (°F/C): 193 degrees F. Method: Setafash Closed Cup
Recommended Extinguishing Media: Carbon dioxide, chemical powder
Special Fire-Fighting Procedures: No special procedures.
Hazardous Products Formed by Fire or Thermal Decomposition: None anticipated
Unusual Fire/Explosion Hazards: None
Lower Explosive Limit: Not determined.

Upper Explosive Limit: Not determined.

6. ACCIDENTAL RELEASE MEASURES

Spill Procedures: Rinse away with water or wipe up with a towel.

7. HANDLING AND STORAGE

Storage: Hand cleaner should be stored at temperatures between 40 degrees F. and 100 degrees F.
Handling: Follow all general safety precautions.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eyes: Not required
Skin: Not required
Ventilation: Provide adequate ventilation
Respiratory Protection: not required under normal use

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: White lotion with pumice
Odor: orange
Boiling Point (°F): Not determined.
pH: 7.0
Solubility in Water: SOLUBLE
Specific Gravity: 1.03
VOC Content(Wt.%): 7 % by weight
Vapor Pressure: Not Determined
Vapor Density (Air=1): Not Determined
Evaporation Rate: Not Determined

10. STABILITY AND REACTIVITY

Chemical Stability: Stable at normal conditions
Hazardous Polymerization: WILL NOT OCCUR
Incompatibilities: None known
Conditions to Avoid: Freezing
Hazardous Products Formed by Fire or Thermal Decomposition: None anticipated

11. TOXICOLOGICAL INFORMATION

See Section 3

12. ECOLOGICAL INFORMATION

No data available

13. DISPOSAL CONSIDERATIONS

Recommended Method of Disposal: Dispose of uncontaminated material through sewer system with permission of the authority responsible for that system.

US EPA Waste Number: NH - Not a RCRA Hazardous Waste Material

14. TRANSPORTATION INFORMATION

DOT (49CFR 172)

Domestic Ground Transport

DOT Shipping Name: Unrestricted
Hazard Class: NONE
UN/ID Number: None
Marine Pollutant: None

IATA

Proper Shipping Name: not regulated
Class or Division: None
UN/NA Number: None

IMDG

Proper Shipping: Unrestricted

Hazard Class: None
UN Number: None

15. REGULATORY INFORMATION

SARA 313 Chemicals: The following component(s) is listed as a SARA Section 313 Toxic Chemical.

SARA 313 Information
NONE

CALIFORNIA PROP 65:

No California Prop 65 chemicals are known to be present at or above the No Significant Risk Level.

TSCA Inventory Status:

Listed on Inventory: YES All components of this product are listed (or exempt) on the EPA TSCA inventory.

16. OTHER INFORMATION

Estimated NFPA Rating: HEALTH 1, FLAMMABILITY 2, REACTIVITY 0

Estimated HMIS Classification: HEALTH 1, FLAMMABILITY 2, PHYSICAL HAZARD 0

NFPA is a registered trademark of the National Fire Protection Assn.

HMIS is a registered trademark of the National Paint and Coatings Assn.

Prepared By: Denise Boyd, Health and Safety Manager
Company: Permatex, Inc. 10 Columbus Blvd. Hartford, CT USA
06106

Revision Date: 01/23/2003

Revision 1

Number:

Telephone Number: 1-87-Permatex (877) 376-2839

GASOLINE

Material Safety Data Sheet

According to the Controlled Product Regulations

1. MATERIAL AND COMPANY IDENTIFICATION

Material Name : Shell Bronze Ethanol Gasoline
Uses : Fuel for spark ignition engines designed to run on unleaded fuel.
Product Code : 002D2186
Manufacturer/Supplier : Shell Canada Products
 400 - 4th Avenue S.W
 Calgary AB T2P 0J4
 Canada
Telephone : (+1) 8006611600
Fax : (+1) 4033848345
Emergency Telephone Number
 : Shell Canada: (+1) 800-661-7378
 CANUTEC (24 hr): (+1) 613-996-6666

2. COMPOSITION/INFORMATION ON INGREDIENTS

Preparation Description : Complex mixture of hydrocarbons consisting of paraffins, cycloparaffins, aromatic and olefinic hydrocarbons with carbon numbers predominantly in the C4 to C12 range. Includes benzene at 1.5% v/v maximum. Contains oxygenated hydrocarbons, including ethanol or other alcohols. May also contain several additives at <0.1% v/v each.

WHMIS Controlled Ingredients

Chemical Identity	CAS No.	Conc. W/W
Gasoline, low boiling point naphtha	86290-81-5	90.00- 100.00 %
Ethanol	64-17-5	0.00- 10.00 %

Contains Benzene, CAS # 71-43-2.

Contains Toluene, CAS # 108-88-3.

Contains Ethylbenzene, CAS # 100-41-4.

Contains n-Hexane, CAS # 110-54-3.

Contains Xylene (Mixed Isomers), CAS # 1330-20-7.

Contains Naphthalene, CAS # 91-20-3.

Contains Cyclohexane, CAS# 110-82-7.

Contains Tri-methyl-benzene (all isomers), CAS# 25551-13-7.

The amount of oxygenated components is limited at 2.7 % m/m calculated as oxygen.

Dyes and markers can be used to indicate tax status and prevent fraud.

Refer to Chapter 8 for Occupational Exposure Guidelines.

Material Safety Data Sheet

According to the Controlled Product Regulations

3. HAZARDS IDENTIFICATION



- WHMIS Class/Description** : Class B2 Flammable Liquid
Class D2A Other Toxic Effects - Carcinogen/Mutagen
Class D2A Other Toxic Effects - Reproductive Toxicity
Class D2B Other Toxic Effects - Skin Irritant
Class D2B Other Toxic Effects - Narcotic effects.
- Health Hazards** : Vapours may cause drowsiness and dizziness. Slightly irritating to respiratory system. Irritating to skin. Moderately irritating to eyes. Harmful: may cause lung damage if swallowed. Possibility of organ or organ system damage from prolonged exposure; see Chapter 11 for details. Target organ(s): Blood-forming organs. Peripheral nervous system. May cause heritable genetic damage. Possible risk of harm to the unborn child. A component or components of this material may cause cancer. This product contains benzene which may cause leukaemia (AML - acute myelogenous leukaemia).
- Signs and Symptoms** : Skin irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blisters. If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath, and/or fever. The onset of respiratory symptoms may be delayed for several hours after exposure. Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache, nausea and loss of coordination. Continued inhalation may result in unconsciousness and death. Damage to blood-forming organs may be evidenced by: a) fatigue and anemia (RBC), b) decreased resistance to infection, and/or excessive bruising and bleeding (platelet effect). Peripheral nerve damage may be evidenced by impairment of motor function (incoordination, unsteady walk, or muscle weakness in the extremities, and/or loss of sensation in the arms and legs). Eye irritation signs and symptoms may include a burning sensation and a temporary redness of the eye. Auditory system effects may include temporary hearing loss and/or ringing in the ears.
- Safety Hazards** : Extremely flammable. Electrostatic charges may be generated during handling. Electrostatic discharge may cause fire. Liquid evaporates quickly and can ignite leading to a flash fire, or an explosion in a confined space.
- Environmental Hazards** : Toxic to aquatic organisms. May cause long-term adverse effects in the environment. Unlike other gasoline components, ethanol is miscible with water.

Material Safety Data Sheet

According to the Controlled Product Regulations

Additional Information : This product is intended for use in closed systems only.

4. FIRST AID MEASURES

- Inhalation** : Remove to fresh air. If rapid recovery does not occur, transport to nearest medical facility for additional treatment.
- Skin Contact** : Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes, and follow by washing with soap and water if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment. When using high pressure equipment, injection of product under the skin can occur. If high pressure injuries occur, the casualty should be sent immediately to a hospital. Do not wait for symptoms to develop.
- Eye Contact** : Flush eyes with water while holding eyelids open. Rest eyes for 30 minutes. If redness, burning, blurred vision, or swelling persist transport to the nearest medical facility for additional treatment.
- Ingestion** : If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. If any of the following delayed signs and symptoms appear within the next 6 hours, transport to the nearest medical facility: fever greater than 101° F (38.3°C), shortness of breath, chest congestion or continued coughing or wheezing.
- Advice to Physician** : Treat symptomatically. Persons on disulfiram (Antabuse®) therapy should be aware that the ethyl alcohol in this product is hazardous to them just as is alcohol from any source. Disulfiram reactions (vomiting, headache and even collapse) may follow ingestion of small amounts of alcohol and have also been described from skin contact.

5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

- Flash point** : < -40 °C / < -40 °F
- Upper / lower Flammability or Explosion limits** : 1 - 8 %(V)
- Auto ignition temperature** : > 250 °C / 482 °F
- Hazardous Combustion Products and Specific Hazards** : Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide. Unidentified organic and inorganic compounds. The vapour is heavier than air, spreads along the ground and distant ignition is possible. Will float and can be reignited on surface water.
- Suitable Extinguishing Media** : Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
- Unsuitable Extinguishing** : Do not use direct water jets on the burning product as they

Material Safety Data Sheet

According to the Controlled Product Regulations

- Media** : could cause a steam explosion and spread of the fire. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.
- Protective Equipment for Firefighters** : Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.
- Additional Advice** : Keep adjacent containers cool by spraying with water. If possible remove containers from the danger zone. If the fire cannot be extinguished the only course of action is to evacuate immediately. Contain residual material at affected sites to prevent material from entering drains (sewers), ditches, and waterways.

6. ACCIDENTAL RELEASE MEASURES

- Protective Measures** : Vapour can travel for considerable distances both above and below the ground surface. Underground services (drains, pipelines, cable ducts) can provide preferential flow paths. Do not breathe fumes, vapour. Take measures to minimise the effects on groundwater. Contain residual material at affected sites to prevent material from entering drains (sewers), ditches, and waterways. Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area. Use appropriate containment (of product and fire fighting water) to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Attempt to disperse the vapour or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment.
- Clean Up Methods** : For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely. For small liquid spills (< 1 drum), transfer by mechanical means to a labelled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.
- Additional Advice** : Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Local authorities should be advised if significant spillages cannot be contained. Maritime spillages should be dealt with using a Shipboard Oil Pollution Emergency Plan (SOPEP), as required by MARPOL Annex 1 Regulation 26.

7. HANDLING AND STORAGE

- General Precautions** : Avoid breathing vapours or contact with material. Only use in

Material Safety Data Sheet

According to the Controlled Product Regulations

well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material. Air-dry contaminated clothing in a well-ventilated area before laundering. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Prevent spillages. Turn off all battery operated portable electronic devices (examples include: cellular phones, pagers and CD players) before operating gasoline pump. Do not use as a cleaning solvent or other non-motor fuel uses. Contaminated leather articles including shoes cannot be decontaminated and should be destroyed to prevent reuse. For comprehensive advice on handling, product transfer, storage and tank cleaning refer to the product supplier.

Vehicle fueling and vehicle workshop areas - Avoid inhalation of vapours and contact with skin, when filling or emptying a vehicle.

- Handling** : When using do not eat or drink. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. Never siphon by mouth. The vapour is heavier than air, spreads along the ground and distant ignition is possible. Avoid exposure.
- Storage** : Drum and small container storage: Keep containers closed when not in use. Drums should be stacked to a maximum of 3 high. Packaged product must be kept tightly closed and stored in a diked (bunded) well-ventilated area, away from, ignition sources and other sources of heat. Use properly labelled and closeable containers. Take suitable precautions when opening sealed containers, as pressure can build up during storage. Tank storage: Tanks must be specifically designed for use with this product. Bulk storage tanks should be diked (bunded). Locate tanks away from heat and other sources of ignition. Cleaning, inspection and maintenance of storage tanks is a specialist operation, which requires the implementation of strict procedures and precautions.
- Product Transfer** : Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (≤ 1 m/sec until fill pipe submerged to twice its diameter, then ≤ 7 m/sec). Avoid splash filling. Do NOT use compressed air for filling, discharging, or handling operations. Wait 2 minutes after tank filling (for tanks such as those on road tanker vehicles) before opening hatches or manholes. Wait 30 minutes after tank filling (for large storage tanks) before opening hatches or manholes.
- Recommended Materials** : For containers, or container linings use mild steel, stainless steel. Aluminium may also be used for applications where it does not present an unnecessary fire hazard. Examples of

Material Safety Data Sheet

According to the Controlled Product Regulations

- Unsuitable Materials** : Suitable materials are: high density polyethylene (HDPE), polypropylene (PP), and Viton (FKM), which have been specifically tested for compatibility with this product. For container linings, use amine-adduct cured epoxy paint. For seals and gaskets use: graphite, PTFE, Viton A, Viton B. Some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Examples of materials to avoid are: natural rubber (NR), nitrile rubber (NBR), ethylene propylene rubber (EPDM), polymethyl methacrylate (PMMA), polystyrene, polyvinyl chloride (PVC), polyisobutylene. However, some may be suitable for glove materials.
- Container Advice** : Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers. Gasoline containers must not be used for storage of other products.
- Additional Information** : Ensure that all local regulations regarding handling and storage facilities are followed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

If the American Conference of Governmental Industrial Hygienists (ACGIH) value is provided on this document, it is provided for information only.

Occupational Exposure Limits

Material	Source	Type	ppm	mg/m3	Notation
Ethanol	ACGIH	STEL	1,000 ppm		
Naphthalene	ACGIH	TWA	10 ppm		
	ACGIH	STEL	15 ppm		
	ACGIH	SKIN_DES			Can be absorbed through the skin.
Cyclohexane	ACGIH	TWA	100 ppm		
Xylene	ACGIH	TWA	100 ppm		
	ACGIH	STEL	150 ppm		
Toluene	ACGIH	TWA	20 ppm		
Benzene	ACGIH	TWA	0.5 ppm		
	ACGIH	STEL	2.5 ppm		

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	ACGIH	SKIN_DES			Can be absorbed through the skin.
	SHELL IS	TWA	0.5 ppm	1.6 mg/m3	
	SHELL IS	STEL	2.5 ppm	8 mg/m3	
n-hexane	ACGIH	TWA	50 ppm		
	ACGIH	SKIN_DES			Can be absorbed through the skin.
Ethylbenzene	ACGIH	TWA	20 ppm		
Trimethylbenzene, all isomers	ACGIH	TWA	25 ppm		
Gasoline, low boiling point naphtha	ACGIH	TWA	300 ppm		
	ACGIH	STEL	500 ppm		

Consult local authorities for acceptable exposure limits within their jurisdiction.

Additional Information : SHELL IS is the Shell Internal Standard. Skin notation means that significant exposure can also occur by absorption of liquid through the skin and of vapour through the eyes or mucous membranes.

Biological Exposure Index (BEI) - See reference for full details

Material	Determinant	Sampling Time	BEI	Reference
Benzene	S-Phenylmercapturic acid in Creatinine in urine	Sampling time: End of shift.	25 µg/g	ACGIH BEL (2011)
	t,t-Muconic acid in Creatinine in urine	Sampling time: End of shift.	500 µg/g	ACGIH BEL (2011)
n-hexane	2,5-Hexanedion, without hydrolysis in Urine	Sampling time: End of shift at end of work week.	0.4 mg/l	ACGIH BEL (2011)

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Toluene	toluene in Urine	Sampling time: End of shift.	0.03 mg/l	ACGIH BEL (2011)
	toluene in Blood	Sampling time: Prior to last shift of work week.	0.02 mg/l	ACGIH BEL (2011)
	o-Cresol, with hydrolysis in Creatinine in urine	Sampling time: End of shift.	0.3 mg/g	ACGIH BEL (2011)
Ethylbenzene	Sum of mandelic acid and phenylglyoxylic acid in Creatinine in urine	Sampling time: End of shift at end of work week.	0.7 g/g	ACGIH BEL (12 2010)
	Ethyl benzene in End-exhaled air	Sampling time: Not critical.		ACGIH BEL (12 2010)
Xylene	Methylhippuric acids in Creatinine in urine	Sampling time: End of shift.	1.5 g/g	ACGIH BEL (2011)
Naphthalene	1- Hydroxypyrene, with hydrolysis (1-HP) in Urine	Sampling time: End of shift at end of work week.		ACGIH BEL (2008)

- Exposure Controls** : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Use sealed systems as far as possible. Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits. Local exhaust ventilation is recommended. Eye washes and showers for emergency use.
- Personal Protective Equipment** : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
- Respiratory Protection** : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of

Material Safety Data Sheet

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	mask and filter. Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. All respiratory protection equipment and use must be in accordance with local regulations.
Hand Protection	: Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Select gloves tested to a relevant standard (e.g. Europe EN374, US F739). When prolonged or frequent repeated contact occurs, Nitrile gloves may be suitable. (Breakthrough time of > 240 minutes.) For incidental contact/splash protection Neoprene, PVC gloves may be suitable.
Eye Protection	: Chemical splash goggles (chemical monogoggles). Approved to EU Standard EN166.
Protective Clothing	: Chemical resistant gloves/gauntlets, boots, and apron (where risk of splashing).
Monitoring Methods	: Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
Environmental Exposure Controls	: Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: Pale straw. Liquid.
Odour	: Hydrocarbon.
Odour threshold	: < 0.25 ppm
pH	: Not applicable.
Initial Boiling Point and Boiling Range	: 25 - 210 °C / 77 - 410 °F
Freezing Point	: Data not available
Vapour pressure	: 550 - 600 hPa at 37.8 °C / 100.0 °F
Specific gravity	: 0.74
Density	: Typical 0.75 g/cm ³ at 15 °C / 59 °F
n-octanol/water partition coefficient (log Pow)	: 2 - 7
Kinematic viscosity	: < 1 mm ² /s at 40 °C / 104 °F
Vapour density (air=1)	: 3.5
Evaporation rate (nBuAc=1)	: Data not available

Material Safety Data Sheet

According to the Controlled Product Regulations

10. STABILITY AND REACTIVITY

Stability	: Stable under normal conditions of use.
Conditions to Avoid	: Avoid heat, sparks, open flames and other ignition sources.
Materials to Avoid	: Strong oxidising agents.
Hazardous Decomposition Products	: Hazardous decomposition products are not expected to form during normal storage. Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases, including carbon monoxide, carbon dioxide and other organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.
Hazardous Polymerisation	: No
Sensitivity to Mechanical Impact	: No
Sensitivity to Static Discharge	: Yes

11. TOXICOLOGICAL INFORMATION

Basis for Assessment	: Information given is based on product data, a knowledge of the components and the toxicology of similar products.
Acute Oral Toxicity	: Low toxicity: LD50 >2000 mg/kg , Rat. Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.
Acute Dermal Toxicity	: Low toxicity: LD50 >2000 mg/kg , Rabbit.
Acute Inhalation Toxicity	: Low toxicity: LC50 >5 mg/l , 4 h , Rat. High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.
Skin Irritation	: Irritating to skin.
Eye Irritation	: Moderately irritating to eyes (but insufficient to classify).
Respiratory Irritation	: Based on human experience, breathing of vapours or mists may cause a temporary burning sensation to nose, throat and lungs.
Sensitisation	: Not expected to be a sensitiser.
Repeated Dose Toxicity	: Kidney: caused kidney effects in male rats which are not considered relevant to humans Blood-forming organs: repeated exposure affects the bone marrow. (Benzene) Peripheral nervous system: repeated exposure causes peripheral neuropathy in animals. (n-hexane)
Mutagenicity	: May cause heritable genetic damage. (Benzene) Mutagenicity studies on gasoline and gasoline blending streams have shown predominantly negative results.
Carcinogenicity	: Known human carcinogen. (Benzene) May cause leukaemia (AML - acute myelogenous leukemia). (Benzene) Inhalation exposure to mice causes liver tumours, which are not

Material Safety Data Sheet

According to the Controlled Product Regulations

Reproductive and Developmental Toxicity	: considered relevant to humans. Causes foetotoxicity at doses which are maternally toxic. (Toluene) Causes adverse effects on the foetus based on animal studies. (Toluene) Many case studies involving abuse during pregnancy indicate that toluene can cause birth defects, growth retardation and learning difficulties. (Toluene) Ethanol, a component of this material, may cause birth defects and/or miscarriages following high oral doses.
Additional Information	: Exposure to very high concentrations of similar materials has been associated with irregular heart rhythms and cardiac arrest. Prolonged and repeated exposures to high concentrations have resulted in hearing loss in rats. Solvent abuse and noise interaction in the work environment may cause hearing loss. Abuse of vapours has been associated with organ damage and death. May cause MDS (Myelodysplastic Syndrome).

12. ECOLOGICAL INFORMATION

Incomplete ecotoxicological data are available for this substance.

Acute Toxicity	: Toxic:LL/EL/IL50 1-10 mg/l(to aquatic organisms)(LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract).
Fish	: Expected to be toxic: LL/EL/IL50 1-10 mg/l
Aquatic Invertebrates	: Expected to be toxic: LL/EL/IL50 1-10 mg/l
Algae	: Expected to be toxic: LL/EL/IL50 1-10 mg/l
Microorganisms	: Expected to be harmful: LL/EL/IL50 10-100 mg/l
Mobility	: Floats on water. Evaporates within a day from water or soil surfaces. Large volumes may penetrate soil and could contaminate groundwater. Contains volatile constituents.
Persistence/degradability	: Major constituents are expected to be inherently biodegradable. The volatile constituents will oxidize rapidly by photochemical reactions in air.
Bioaccumulation	: Expected to be inherently biodegradable. Contains constituents with the potential to bioaccumulate.
Other Adverse Effects	: Films formed on water may affect oxygen transfer and damage organisms.

13. DISPOSAL CONSIDERATIONS

Material Disposal	: Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Waste arising from a spillage or tank
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Material Safety Data Sheet

According to the Controlled Product Regulations

- cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand. Do not dispose into the environment, in drains or in water courses. Do not dispose of tank water bottoms by allowing them to drain into the ground. This will result in soil and groundwater contamination.
- Container Disposal** : Drain container thoroughly. After draining, vent in a safe place away from sparks and fire. Residues may cause an explosion hazard. Do not, puncture, cut, or weld uncleaned drums. Send to drum recoverer or metal reclaimer. Do not pollute the soil, water or environment with the waste container.
- Local Legislation** : Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied with.

14. TRANSPORT INFORMATION**Canadian Road and Rail Shipping Classification**

UN/NA Number	UN 1203
Proper shipping name	GASOLINE
Class Division	3
Packing group	II
Shipping Description	GASOLINE, Class 3, UN 1203, PG II
Additional Information	Marine pollutant MARPOL Annex 1 rules apply for bulk shipments by sea.

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

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.

- WHMIS Class/Description** :
- Class B2 Flammable Liquid
 - Class D2A Other Toxic Effects - Carcinogen/Mutagen
 - Class D2A Other Toxic Effects - Reproductive Toxicity
 - Class D2B Other Toxic Effects - Skin Irritant
 - Class D2B Other Toxic Effects - Narcotic effects.

16. OTHER INFORMATION

- Additional Information** : This document contains important information to ensure the safe storage, handling and use of this product. The information in this document should be brought to the attention of the person in your organisation responsible for advising on safety matters.
- MSDS Version Number** : 1.1

Material Safety Data Sheet

According to the Controlled Product Regulations

- MSDS Effective Date** : 11-04-2011
- MSDS Revisions** : A vertical bar (|) in the left margin indicates an amendment from the previous version.
- MSDS Regulation** : The content and format of this (M)SDS is in accordance with the Controlled Product Regulations.
- MSDS Prepared By** : Shell Product Stewardship; 1-800-661-1600
- Uses and Restrictions** : This product must not be used in applications other than those recommended in Section 1, without first seeking the advice of the supplier. This product is not to be used as a solvent or cleaning agent; for lighting or brightening fires; as a skin cleanser. This product is designed only to suit automotive applications and no provision is made for the requirements of aviation applications.
- MSDS Distribution** : The information in this document should be made available to all who may handle the product.
- Disclaimer** : The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.

**HAVOLINE
50/50 PREMIX
ANTIFREEZE**

**INSULATING
FOAM
SEALANT**



Material Safety Data Sheet

The Dow Chemical Company

Product Name: GREAT STUFF™ Big Gap Filler Insulating Foam Sealant 12oz HC

Issue Date: 2012.12.10

Print Date: 23 Jan 2013

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

GREAT STUFF™ Big Gap Filler Insulating Foam Sealant 12oz HC

COMPANY IDENTIFICATION

The Dow Chemical Company
2030 Willard H. Dow Center
Midland, MI 48674
United States

For MSDS updates and Product Information: 800-258-2436

Prepared By: Prepared for use in Canada by EH&S, Hazard Communications.
Revision 2012.12.10
Print Date: 1/23/2013

Customer Information Number: 800-258-2436

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 989-636-4400
Local Emergency Contact: 989-636-4400

2. Hazards Identification

Emergency Overview

Color: Yellow
Physical State: Foam
Odor: Mild

Hazards of product:

DANGER! Flammable gas - May cause flash fire. May cause allergic skin reaction. May cause allergic respiratory reaction. May cause eye irritation. May cause skin irritation. Vapor reduces oxygen available for breathing. May cause anesthetic effects. May cause respiratory tract irritation. Vapors may travel a long distance; ignition and/or flash back may occur. Evacuate area. Keep upwind of spill. Stay out of low areas. Aerosol cans exposed to fire can rupture becoming flaming projectiles. Elevated temperatures can cause hazardous polymerization. Toxic fumes may be released in fire situations. Contents under pressure. Avoid temperatures above 49°C (120.2°F)

Potential Health Effects

Eye Contact: May cause eye irritation. May cause slight temporary corneal injury.
Skin Contact: Prolonged contact may cause moderate skin irritation with local redness. Material may stick to skin causing irritation upon removal. May stain skin.
Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.
Skin Sensitization: Skin contact may cause an allergic skin reaction. Animal studies have shown that skin contact with isocyanates may play a role in respiratory sensitization.
Inhalation: In confined or poorly ventilated areas, vapor can easily accumulate and can cause unconsciousness and death due to displacement of oxygen. Excessive exposure may cause irritation to upper respiratory tract (nose and throat) and lungs. May cause pulmonary edema (fluid in the lungs.) Effects may be delayed. May cause central nervous system depression. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed. Excessive exposure may increase sensitivity to epinephrine and increase myocardial irritability (irregular heartbeats). Decreased lung function has been associated with overexposure to isocyanates.
Respiratory Sensitization: May cause allergic respiratory response. MDI concentrations below the exposure guidelines may cause allergic respiratory reactions in individuals already sensitized. Asthma-like symptoms may include coughing, difficult breathing and a feeling of tightness in the chest. Occasionally, breathing difficulties may be life threatening.
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. Observations in animals include: Gastrointestinal irritation.
Aspiration hazard: Based on physical properties, not likely to be an aspiration hazard.
Effects of Repeated Exposure: Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI/polymeric MDI aerosols. Contains component(s) which have been reported to cause effects on the following organs in animals: Kidney. Liver.
Cancer Information: Lung tumors have been observed in laboratory animals exposed to respirable aerosol droplets of MDI/Polymeric MDI (6 mg/m³) for their lifetime. Tumors occurred concurrently with respiratory irritation and lung injury. Current exposure guidelines are expected to protect against these effects reported for MDI.
Birth Defects/Developmental Effects: In laboratory animals, MDI/polymeric MDI did not cause birth defects; other fetal effects occurred only at high doses which were toxic to the mother.

3. Composition/information on ingredients

Component	CAS #	Amount W/W
Diphenylmethane Diisocyanate, isomers and homologues	9016-87-9	>= 10.0 - <= 30.0 %
Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.,.alpha.',.alpha."-1,2,3-propanetriyltris[.omega.-hydroxypoly	57029-46-6	>= 30.0 - <= 60.0 %

Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer	53862-89-8	>= 10.0 - <= 30.0 %
Tris(1-chloro-2-propyl) phosphate	13674-84-5	>= 5.0 - <= 10.0 %
Paraffin waxes and Hydrocarbon waxes, chlorinated	63449-39-8	>= 5.0 - <= 10.0 %
Isobutane	75-28-5	>= 5.0 - <= 10.0 %
Methyl ether	115-10-6	>= 1.0 - <= 5.0 %
Propane	74-98-6	>= 1.0 - <= 5.0 %
4,4' -Methylenediphenyl diisocyanate	101-68-8	>= 5.0 - <= 10.0 %

Amounts are presented as percentages by weight.

Note: CAS 101-68-8 is an MDI isomer that is part of CAS 9016-87-9.

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: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. An MDI skin decontamination study demonstrated that cleaning very soon after exposure is important, and that a polyglycol-based skin cleanser or corn oil may be more effective than soap and water. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands. Suitable emergency safety shower facility should be available in work area.

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: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

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 respiratory sensitization or asthma-like symptoms. Bronchodilators, expectorants and antitussives may be of help. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. Exposure may increase "myocardial irritability". Do not administer sympathomimetic drugs such as epinephrine unless absolutely necessary. If you are sensitized to diisocyanates, consult your physician regarding working with other respiratory irritants or sensitizers. Although cholinesterase depression has been reported with this material, it is not of benefit in determining exposure and need not be considered in the treatment of persons exposed to the material. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome). Repeated excessive exposure may aggravate preexisting lung disease.

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.

Extinguishing Media to Avoid: Do not use direct water stream. Straight or direct water streams may not be effective to extinguish fire.

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: Nitrogen oxides. Isocyanates. Hydrogen chloride. Carbon monoxide. Carbon dioxide. Hydrogen cyanide.

Unusual Fire and Explosion Hazards: Contains flammable propellant. Aerosol cans exposed to fire can rupture and become flaming projectiles. Propellant release may result in a fireball. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Dense smoke is produced when product burns.

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. Water may not be effective in extinguishing fire. Do not use direct water stream. May spread fire. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Eliminate ignition sources. Move container from fire area if this is possible without hazard. Use water spray to cool fire-exposed containers and fire-affected zone until fire is out.

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). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

See Section 9 for related Physical Properties

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Keep personnel out of low areas. Keep personnel out of confined or poorly ventilated areas. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Confined space entry procedures must be followed before entering the area. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. See Section 10 for more specific information. 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: Contain spilled material if possible. Isolate area until gas has dispersed. Use non-sparking tools in cleanup operations. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Collect in suitable and properly labeled containers. Absorb with materials such as: Clay. Dirt. Milsorb®. Sand. Sawdust. Vermiculite. See Section 10 for more specific information. See Section 13, Disposal Considerations, for additional information.

7. Handling and Storage

Handling

General Handling: Keep away from heat, sparks and flame. No smoking, open flames or sources of ignition in handling and storage area. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated contact with skin. Avoid breathing vapor. Wash thoroughly after handling. Keep container closed. Use only with adequate ventilation. Keep out of reach of children. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Contents under pressure. Do not puncture or incinerate container. 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. Do not enter confined spaces unless adequately ventilated. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Storage

Minimize sources of ignition, such as static build-up, heat, spark or flame. Store in a dry place. See Section 10 for more specific information.

Shelf life: Use within **Do not store above:**
 12 Months 49 °C

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
4,4' -Methylenediphenyl diisocyanate	ACGIH	TWA	0.005 ppm
	CAD AB OEL	TWA	0.05 mg/m3 0.005 ppm
	CAD BC OEL	TWA	0.005 ppm SKIN
	CAD BC OEL	CEILING	0.01 ppm SKIN
	CAD ON OEL	TWAEV	0.005 ppm
	CAD ON OEL	CEV	0.02 ppm
	OEL (QUE)	TWA	0.051 mg/m3 0.005 ppm SEN Exposure must be minimized.
	CAD SK OEL	8 HR ACL	0.005 ppm
	CAD SK OEL	15 MIN ACL	0.015 ppm
Methyl ether	CAD BC OEL	TWA	1,000 ppm
	AIHA WEEL	TWA	1,880 mg/m3 1,000 ppm
Isobutane	OEL (QUE)	TWA	1,900 mg/m3 800 ppm
	CAD ON OEL	TWAEV	1,000 ppm
	CAD BC OEL	TWA	1,000 ppm
	CAD ON OEL	TWAEV	1,900 mg/m3 800 ppm
	ACGIH	TWA	1,000 ppm
Propane	OEL (QUE)	TWA	1,800 mg/m3 1,000 ppm
	CAD AB OEL	TWA	1,000 ppm
	CAD ON OEL	TWAEV	1,000 ppm
	CAD BC OEL	TWA	1,000 ppm
	ACGIH	TWA	1,000 ppm

Consult local authorities for recommended exposure limits.

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.

A "SEN" notation following the exposure guideline refers to the potential to produce sensitization, as confirmed by human or animal data.

Personal Protection

Eye/Face Protection: Use safety glasses (with side shields).

Skin Protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Viton. Polyvinyl chloride ("PVC" or "vinyl"). 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: Atmospheric levels should be maintained below the exposure guideline. When atmospheric levels may exceed the exposure guideline, use an approved air-purifying respirator equipped with an organic vapor sorbent and a particle filter. For situations where the atmospheric levels may exceed the level for which an air-purifying respirator is effective, use a positive-pressure air-supplying respirator (air line or self-contained breathing apparatus). For emergency response or for situations where the atmospheric level is unknown, use an approved positive-pressure self-contained breathing apparatus or positive-pressure air line with auxiliary self-contained air supply. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls

Ventilation: Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations. Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. The odor and irritancy of this material are inadequate to warn of excessive exposure. Lethal concentrations may exist in areas with poor ventilation.

9. Physical and Chemical Properties

Appearance

Physical State	Foam
Color	Yellow
Odor	Mild
Odor Threshold	No test data available
pH	<i>Not applicable</i>
Melting Point	No test data available
Freezing Point	No test data available
Boiling Point (760 mmHg)	Not applicable.
Flash Point - Closed Cup	-104 °C <i>Estimated.</i>
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	Flammable gas.
Flammable Limits In Air	Lower: No test data available Upper: No test data available

Vapor Pressure	1,151 kPa @ 55 °C <i>Calculated</i>
Vapor Density (air = 1)	No test data available
Specific Gravity (H₂O = 1)	1.06 <i>Estimated.</i>
Solubility in water (by weight)	Insoluble
Partition coefficient, n-octanol/water (log Pow)	Reacts with water.
Autoignition Temperature	No test data available
Decomposition Temperature	No test data available
Kinematic Viscosity	Not applicable
Explosive properties	Not explosive
Oxidizing properties	No

10. Stability and Reactivity

Reactivity

No dangerous reaction known under conditions of normal use.

Chemical stability

Stable under recommended storage conditions. See Storage, Section 7. Unstable at elevated temperatures.

Possibility of hazardous reactions

Can occur. Elevated temperatures can cause hazardous polymerization.

Conditions to Avoid: Avoid temperatures above 116 °C. Elevated temperatures can cause container to vent and/or rupture. Exposure to elevated temperatures can cause product to decompose.

Incompatible Materials: Avoid contact with: Acids. Alcohols. Amines. Ammonia. Bases. Metal compounds. Strong oxidizers. Products based on diisocyanates like TDI and MDI react with many materials to release heat. The reaction rate increases with temperature as well as with increased contact; these reactions can become violent. Contact is increased by stirring or if the other material acts as a solvent. Products based on diisocyanates such as TDI and MDI are not soluble in water and will sink to the bottom, but react slowly at the interface. The reaction forms carbon dioxide gas and a layer of solid polyurea. Reaction with water will generate carbon dioxide and heat.

Hazardous decomposition products

Decomposition products depend upon temperature, air supply and the presence of other materials. Toxic gases are released during decomposition.

11. Toxicological Information

Acute Toxicity

Ingestion

As product: Single dose oral LD50 has not been determined.

Estimated. LD50, rat > 2,000 mg/kg

Dermal

As product: The dermal LD50 has not been determined.

Estimated. LD50, rabbit > 2,000 mg/kg

Inhalation

As product: The LC50 has not been determined.

Eye damage/eye irritation

May cause eye irritation. May cause slight temporary corneal injury.

Skin corrosion/irritation

Prolonged contact may cause moderate skin irritation with local redness. Material may stick to skin causing irritation upon removal. May stain skin.

Sensitization

Skin

Skin contact may cause an allergic skin reaction. Animal studies have shown that skin contact with isocyanates may play a role in respiratory sensitization.

Respiratory

May cause allergic respiratory response. MDI concentrations below the exposure guidelines may cause allergic respiratory reactions in individuals already sensitized. Asthma-like symptoms may include coughing, difficult breathing and a feeling of tightness in the chest. Occasionally, breathing difficulties may be life threatening.

Repeated Dose Toxicity

Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI/polymeric MDI aerosols. Contains component(s) which have been reported to cause effects on the following organs in animals: Kidney. Liver.

Chronic Toxicity and Carcinogenicity

Lung tumors have been observed in laboratory animals exposed to respirable aerosol droplets of MDI/Polymeric MDI (6 mg/m³) for their lifetime. Tumors occurred concurrently with respiratory irritation and lung injury. Current exposure guidelines are expected to protect against these effects reported for MDI.

Developmental Toxicity

In laboratory animals, MDI/polymeric MDI did not cause birth defects; other fetal effects occurred only at high doses which were toxic to the mother.

Reproductive Toxicity

No relevant data found.

Genetic Toxicology

In vitro genetic toxicity studies were negative for component(s) tested. Genetic toxicity data on MDI are inconclusive. MDI was weakly positive in some in vitro studies; other in vitro studies were negative. Animal mutagenicity studies were predominantly negative.

Component Toxicology - Diphenylmethane Diisocyanate, isomers and homologues

Inhalation	LC50, 4 h, Aerosol, rat 0.49 mg/l
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Inhalation	For similar material(s): 2,4'-Diphenylmethane diisocyanate (CAS 5873-54-1). LC50, 4 h, Aerosol, rat 0.31 mg/l
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Inhalation	For similar material(s): 4,4'-Methylenediphenyl diisocyanate (CAS 101-68-8). LC50, 1 h, Aerosol, rat 2.24 mg/l
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Component Toxicology - Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.,.alpha.',.alpha."-1,2,3-propanetriyltris[.omega.-hydroxypoly

Inhalation	As product: The LC50 has not been determined.
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Inhalation	For similar material(s): 4,4'-Methylenediphenyl diisocyanate (CAS 101-68-8). LC50, 1 h, Aerosol, rat 2.24 mg/l
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Inhalation	For similar material(s): 2,4'-Diphenylmethane diisocyanate (CAS 5873-54-1). LC50, 4 h, Aerosol, rat 0.31 mg/l
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Component Toxicology - Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer

Inhalation	As product: The LC50 has not been determined.
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Inhalation	For similar material(s): 4,4'-Methylenediphenyl diisocyanate (CAS 101-68-8). LC50, 1 h, Aerosol, rat 2.24 mg/l
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Inhalation	For similar material(s): 2,4'-Diphenylmethane diisocyanate (CAS 5873-54-1). LC50, 4 h, Aerosol, rat 0.31 mg/l
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Component Toxicology - Tris(1-chloro-2-propyl) phosphate

Inhalation	LC50, 4 h, Aerosol, rat > 7 mg/l
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Component Toxicology - Isobutane

Inhalation	LC50, 1 h, mouse 52 mg/l
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Component Toxicology - Methyl ether

Inhalation	LC50, 4 h, Vapor, mouse 222,716 ppm
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Component Toxicology - Propane

Inhalation	LC50, 4 h, Vapor, rat, male and female > 425,000 ppm
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Component Toxicology - 4,4' -Methylenediphenyl diisocyanate

Inhalation	LC50, 1 h, Aerosol, rat 2.24 mg/l
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12. Ecological Information

Toxicity

Data for Component: **Diphenylmethane Diisocyanate, isomers and homologues**

The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species. 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

Based on information for a similar material: LC50, Danio rerio (zebra fish), static test, 96 h: > 1,000 mg/l

Aquatic Invertebrate Acute Toxicity

Based on information for a similar material: EC50, Daphnia magna (Water flea), static test, 24 h: > 1,000 mg/l

Aquatic Plant Toxicity

Based on information for a similar material: NOEC, Desmodium subspicatus (green algae), static test, Growth rate inhibition, 72 h: 1,640 mg/l

Toxicity to Micro-organisms

Based on information for a similar material: EC50; activated sludge, static test, 3 h: > 100 mg/l

Toxicity to Soil Dwelling Organisms

EC50, Eisenia fetida (earthworms), 14 d: > 1,000 mg/kg

Data for Component: **Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.,.alpha.',.alpha."-1,2,3-propanetriyltris[.omega.-hydroxypoly**

Not expected to be acutely toxic to aquatic organisms.

Data for Component: **Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer**

Not expected to be acutely toxic to aquatic organisms.

Data for Component: **Tris(1-chloro-2-propyl) phosphate**

Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

LC50, Lepomis macrochirus (Bluegill sunfish), static test, 96 h: 84 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, Daphnia magna (Water flea), 48 h, immobilization: 131 mg/l

Aquatic Plant Toxicity

ErC50, Pseudokirchneriella subcapitata (green algae), static test, Growth rate inhibition, 96 h: 82 mg/l

Toxicity to Micro-organisms

EC50, OECD 209 Test; activated sludge, Respiration inhibition, 3 h: 784 mg/l

Aquatic Invertebrates Chronic Toxicity Value

Daphnia magna (Water flea), semi-static test, 21 d, number of offspring, NOEC: 32 mg/l

Data for Component: **Paraffin waxes and Hydrocarbon waxes, chlorinated**

Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive species).

Fish Acute & Prolonged Toxicity

LC50, Oncorhynchus mykiss (rainbow trout), static test, 96 h: > 100 mg/l

Aquatic Invertebrate Acute Toxicity

|| EC50, Daphnia magna (Water flea), static test, 48 h, immobilization: 0.037 mg/l

Data for Component: Isobutane

|| No relevant data found.

Data for Component: Methyl ether

|| 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, Poecilia reticulata (guppy), semi-static test, 96 h: > 4,000 mg/l

Aquatic Invertebrate Acute Toxicity

|| LC50, Daphnia magna (Water flea), 48 h, immobilization: > 4,000 mg/l

Data for Component: Propane

|| No relevant data found.

Data for Component: 4,4' -Methylenediphenyl diisocyanate

|| The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species. 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

|| Based on information for a similar material: LC50, Danio rerio (zebra fish), static test, 96 h: > 1,000 mg/l

Aquatic Invertebrate Acute Toxicity

|| Based on information for a similar material: EC50, Daphnia magna (Water flea), static test, 24 h: > 1,000 mg/l

Aquatic Plant Toxicity

|| Based on information for a similar material: NOEC, Desmodesmus subspicatus (green algae), static test, Growth rate inhibition, 72 h: 1,640 mg/l

Toxicity to Micro-organisms

|| Based on information for a similar material: EC50; activated sludge, static test, 3 h: > 100 mg/l

Toxicity to Soil Dwelling Organisms

|| EC50, Eisenia fetida (earthworms), 14 d: > 1,000 mg/kg

Persistence and Degradability

Data for Component: Diphenylmethane Diisocyanate, isomers and homologues

|| In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.

|| **OECD Biodegradation Tests:** Based on information for a similar material:

Biodegradation	Exposure Time	Method	10 Day Window
0 %	28 d	OECD 302C Test	Not applicable

Data for Component: Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.,.alpha',.alpha."-1,2,3-propanetriyltris[.omega.-hydroxypoly

|| Expected to degrade only slowly in the environment.

Data for Component: Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer

|| Expected to degrade only slowly in the environment.

Data for Component: Tris(1-chloro-2-propyl) phosphate

|| Material is expected to biodegrade only very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

|| **OECD Biodegradation Tests:**

Biodegradation	Exposure Time	Method	10 Day Window
14 %	28 d	OECD 301E Test	fail

95 %	64 d	OECD 302A Test	Not applicable
Indirect Photodegradation with OH Radicals			
Rate Constant	Atmospheric Half-life	Method	
4.47E-11 cm ³ /s	0.24 d	Estimated.	
Theoretical Oxygen Demand: 1.17 mg/mg			

Data for Component: **Paraffin waxes and Hydrocarbon waxes, chlorinated**

Expected to degrade only slowly in the environment.
Theoretical Oxygen Demand: 2.89 mg/mg

Data for Component: **Isobutane**

Biodegradation may occur under aerobic conditions (in the presence of oxygen).

Indirect Photodegradation with OH Radicals			
Rate Constant	Atmospheric Half-life	Method	
2.44E-12 cm ³ /s	4.4 d	Estimated.	
Theoretical Oxygen Demand: 3.58 mg/mg			

Data for Component: **Methyl ether**

Material is expected to biodegrade only very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

OECD Biodegradation Tests:			
Biodegradation	Exposure Time	Method	10 Day Window
5 %	28 d	OECD 301A Test	fail
Indirect Photodegradation with OH Radicals			
Rate Constant	Atmospheric Half-life	Method	
1.66E-12 cm ³ /s	6.4 d	Estimated.	
Theoretical Oxygen Demand: 2.08 mg/mg			

Data for Component: **Propane**

No relevant data found.

Indirect Photodegradation with OH Radicals			
Rate Constant	Atmospheric Half-life	Method	
1.27E-12 cm ³ /s	8.4 d	Estimated.	
Theoretical Oxygen Demand: 3.64 mg/mg			

Data for Component: **4,4'-Methylenediphenyl diisocyanate**

In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.

OECD Biodegradation Tests: Based on information for a similar material:			
Biodegradation	Exposure Time	Method	10 Day Window
0 %	28 d	OECD 302C Test	Not applicable

Bioaccumulative potential

Data for Component: **Diphenylmethane Diisocyanate, isomers and homologues**

Bioaccumulation: In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Data for Component: **Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.,.alpha.',.alpha."-1,2,3-propanetriyl(tris[.omega.-hydroxypoly**

Bioaccumulation: In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Data for Component: **Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer**

Bioaccumulation: In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Data for Component: **Tris(1-chloro-2-propyl) phosphate**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient, n-octanol/water (log Pow): 2.59 Measured

Bioconcentration Factor (BCF): 0.8 - 4.6; Cyprinus carpio (Carp); Measured
 Data for Component: **Paraffin waxes and Hydrocarbon waxes, chlorinated**
Bioaccumulation: Bioconcentration potential is low (BCF less than 100 or log Pow greater than 7).
Partition coefficient, n-octanol/water (log Pow): 7.4 Estimated.
 Data for Component: **Isobutane**
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient, n-octanol/water (log Pow): 2.76 Measured
 Data for Component: **Methyl ether**
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient, n-octanol/water (log Pow): 0.10 Measured
 Data for Component: **Propane**
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient, n-octanol/water (log Pow): 2.36 Measured
 Data for Component: **4,4' -Methylenediphenyl diisocyanate**
Bioaccumulation: In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Mobility in soil

Data for Component: **Diphenylmethane Diisocyanate, isomers and homologues**
Mobility in soil: In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.
 Data for Component: **Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.,.alpha.',.alpha.'-1,2,3-propanetriyltris[.omega.-hydroxypoly**
Mobility in soil: In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.
 Data for Component: **Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer**
Mobility in soil: In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.
 Data for Component: **Tris(1-chloro-2-propyl) phosphate**
Mobility in soil: Potential for mobility in soil is slight (Koc between 2000 and 5000).
Partition coefficient, soil organic carbon/water (Koc): 1,300 Estimated.
Henry's Law Constant (H): < 1.35E-05 atm*m3/mole; 25 °C Estimated.
 Data for Component: **Paraffin waxes and Hydrocarbon waxes, chlorinated**
Mobility in soil: Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Expected to be relatively immobile in soil (Koc > 5000).
Partition coefficient, soil organic carbon/water (Koc): > 5,000 Estimated.
Henry's Law Constant (H): < 1.0E-07 atm*m3/mole; 25 °C Estimated.
 Data for Component: **Isobutane**
Mobility in soil: Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient, soil organic carbon/water (Koc): 35 Estimated.
Henry's Law Constant (H): 1.19E+00 atm*m3/mole; 25 °C Measured
Distribution in Environment: Mackay Level 1 Fugacity Model:

Air	Water.	Biota	Soil	Sediment
100 %	0 %	0 %	0 %	0 %

Data for Component: **Methyl ether**
Mobility in soil: Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient, soil organic carbon/water (Koc): 1.29 - 14 Estimated.
Henry's Law Constant (H): 9.78E-04 atm*m3/mole; 25 °C Measured

Data for Component: **Propane**
Mobility in soil: Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient, soil organic carbon/water (Koc): 24 - 460 Estimated.
Henry's Law Constant (H): 7.07E-01 atm*m3/mole; 25 °C Measured
Distribution in Environment: Mackay Level 1 Fugacity Model:

Air	Water.	Biota	Soil	Sediment
100 %	0 %	0 %	0 %	0 %

Data for Component: **4,4' -Methylenediphenyl diisocyanate**
Mobility in soil: In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

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

TDG Small container

CONSUMER COMMODITY RECLASSIFIED AS ORM-D MATERIAL

TDG Large container

NOT AVAILABLE IN BULK CONTAINERS

IMDG

Proper Shipping Name: AEROSOLS

Hazard Class: 2.1 **ID Number:** UN1950

EMS Number: F-D,S-U

Marine pollutant.: Yes

LIMITED QUANTITY

ICAO/IATA

Proper Shipping Name: AEROSOLS, FLAMMABLE

Hazard Class: 2.1 **ID Number:** UN1950 **Cargo Packing Instruction:** 203

Passenger Packing Instruction: 203

LIMITED QUANTITY

15. Regulatory Information

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.

Hazardous Products Act Information: CPR Compliance

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

Hazardous Products Act Information: WHMIS Classification

B5	Flammable Aerosols
D2A	Respiratory Tract Sensitizer
D2B	Eye or Skin Irritant
D2B	Skin Sensitizer

Hazardous Products Act Information: Hazardous Ingredients

This product contains the following ingredients which are Controlled Products and/or are on the Ingredient Disclosure List (Canadian HPA Section 13 and 14).

Component	CAS #	Amount W/W
Isobutane	75-28-5	>= 5.0 - <= 10.0 %
Methyl ether	115-10-6	>= 1.0 - <= 5.0 %
Propane	74-98-6	>= 1.0 - <= 5.0 %
Diphenylmethane Diisocyanate, isomers and homologues	9016-87-9	>= 10.0 - <= 30.0 %
4,4' -Methylenediphenyl diisocyanate	101-68-8	>= 5.0 - <= 10.0 %

16. Other Information

Recommended Uses and Restrictions

Identified uses

Polyurethane foam.

Revision

Identification Number: 63952 / 0000 / Issue Date 2012.12.10 / Version: 3.0

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
VOL/VOL	Volume/Volume

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.

KRESTO



Material Safety Data Sheet

MSDS ID: SK-117D

*** Section 1 - Chemical Product and Company Identification ***

Product Name: **KRESTO® & KRESTO® Heavy Duty Hand Cleaner**

Product Use: Hand Cleanser

Manufacturer Information

Evonik Corporation
2401 Doyle Street
Greensboro, NC 27406

Non-Emergency # 800-242-2271

Emergency # (800) 424-9300 CHEMTREC (North America)
Emergency # (703) 527-3887 CHEMTREC (International, call collect)

Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving the product. All Non-emergency questions should be directed to the Toll Free, Non-Emergency number above.

*** Section 2 - Hazards Identification ***

Emergency Overview

No particular hazards known.

Potential Health Effects: Eyes

This product may cause slight irritation to the eyes.

Potential Health Effects: Skin

None.

Potential Health Effects: Ingestion

Seek medical attention.

Potential Health Effects: Inhalation

Prolonged inhalation may cause irritation and respiratory tract discomfort.

HMIS Ratings: Health: 1 Fire: 1 Reactivity: 0 Pers. Prot.: None required.

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

*** Section 3 - Composition / Information on Ingredients ***

CAS #	Component
52-51-7	1,3-Propanediol,2-bromo-2-nitro-

Component Information/Information on Non-Hazardous Components

This product is a cosmetic intended for personal use in the workplace and is thus regulated by FDA.

See container label regarding proper handling and use of this product.

Ingredients are listed in descending order of concentration on the container label.

For OSHA workplace hazards, investigate and read and understand component MSDS's before manufacturing.

Toxic Substances Control Act (TSCA): Exempt

Workplace Hazardous Materials Information System (WHIMS-Canada): Exempt-cosmetic hand cleanser

Material Safety Data Sheet

Product Name: KRESTO & KRESTO Heavy Duty Hand Cleaner

MSDS ID: SK-117D

*** Section 4 - First Aid Measures ***

First Aid: Eyes

In case of contact, immediately flush eyes with large amounts of water, continuing to flush for 15 minutes. If irritation persists get medical attention.

First Aid: Skin

Intended as a cosmetic hand cleaner.

First Aid: Ingestion

If material is swallowed, get medical attention or advice.

First Aid: Inhalation

If symptoms are experienced, remove source of contamination or move victim to fresh air.

*** Section 5 - Fire Fighting Measures ***

General Fire Hazards

None.

Upper Flammable Limit (UFL): Not determined

Lower Flammable Limit (LFL): Not determined

Method Used: Estimated

Flash Point: >200°F

Flammability Classification: Not Determined

Auto Ignition: Not determined

Hazardous Combustion Products

None identified.

Extinguishing Media

Dry chemical, foam, carbon dioxide, water fog.

Fire Fighting Equipment/Instructions

Firefighters should wear self-contained air supplied breathing apparatus in enclosed areas or in areas of heavy smoke or fumes.

NFPA Ratings: Health: 1 Fire: 1 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

*** Section 6 - Accidental Release Measures ***

Containment Procedures

Absorb spill with inert material.

Clean-Up Procedures

Absorb spill with inert material. Shovel material into appropriate container for disposal. Flush small residuals to the drain for normal biological wastewater treatment.

Evacuation Procedures

None.

Special Procedures

None.

*** Section 7 - Handling and Storage ***

Handling Procedures

Keep container closed. See container label for proper use.

Material Safety Data Sheet

Product Name: KRESTO & KRESTO Heavy Duty Hand Cleaner

MSDS ID: SK-117D

Storage Procedures

Protect from freezing or extreme heat.

*** Section 8 - Exposure Controls / Personal Protection ***

Exposure Guidelines

A: General Product Information

FDA regulated. For OSHA workplace hazards, investigate and read and understand component MSDS's before manufacturing.

B: Component Exposure Limits

No information is available.

Engineering Controls

None necessary.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Avoid eye contact.

Personal Protective Equipment: Skin

None.

Personal Protective Equipment: Respiratory

Not required for product end use.

Personal Protective Equipment: General

Obey reasonable safety precautions and practice good housekeeping.

*** Section 9 - Physical & Chemical Properties ***

Appearance: Beige paste	Odor: perfume fragrance (0.1-1%)
Physical State: liquid (Emulsion)	pH: 5.2 – 5.8
Vapor Pressure: 0.07 mm Hg	Vapor Density: Not Established
Boiling Point: >212 °F	Melting Point: 32° F
Solubility (H2O): approximately 25% soluble in water	Specific Gravity: 1.05 g/cc ³ minimum
Evaporation Rate: <1	Flash Point: >200°F (Estimated)
	Percent Volatile: 0% (Federal); LVP-VOC only (California)

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

Stable under usual application conditions.

Chemical Stability: Conditions to Avoid

None.

Incompatibility

None identified.

Hazardous Decomposition

None identified.

Hazardous Polymerization

Hazardous polymerization will not occur.

Material Safety Data Sheet

Product Name: KRESTO & KRESTO Heavy Duty Hand Cleaner

MSDS ID: SK-117D

*** Section 11 - Toxicological Information ***

Acute and Chronic Toxicity

A: General Product Information

Adverse effects on human health are not to be expected in normal use.

B: Acute Toxicity-LD50/LC50

No LD50/LC50's are available for this product's components.

Carcinogenicity

A: General Product Information

Not listed by ACGIH, IARC, NIOSH, NTP OR OSHA.

B: Component Carcinogenicity

No information is available.

Other Toxicological Information

None.

*** Section 12 - Ecological Information ***

Ecotoxicity

A: General Product Information

No information available.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

No information available.

Environmental Fate

No information available.

*** Section 13 - Disposal Considerations ***

US EPA Waste Number & Descriptions

A: General Product Information

Controlled release of diluted product into a biological wastewater treatment plant.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

*** Section 14 - Transportation Information ***

International Transportation Regulations

This product is not regulated as a hazardous material by the United States (DOT) or Canadian (TDG) transportation regulations.

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: General Product Information

Not regulated under the Clean Air Act, Not subject to TSCA regulation. Regulated as a personal use cosmetic by FDA.

B: Clean Air Act

No information is available.

C: Component Analysis

No information is available.

Material Safety Data Sheet

Product Name: KRESTO & KRESTO Heavy Duty Hand Cleaner

MSDS ID: SK-117D

D: Food & Drug Administration

None of the components in this product are listed by the FDA under regulations for Direct and Indirect Food Additives.

State Regulations

A: General Product Information

California: Volatiles are LVP --VOC's, fragrance is <2% exempt.

B: Component Analysis - State

None of this product's components are listed on the state lists from CA, FL, MA, MN, NJ, or PA.

Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL

Component Analysis Inventory

Component	CAS #	TSCA	CAN	EEC
1,3-Propanediol,2-bromo-2-nitro-	52-51-7	Exempt	DSL	EINECS

*** Section 16 - Other Information ***

Other Information

The information provided in this Material 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 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.

MSDS History

This is a revised MSDS. Section's 2 & 3 have been revised to reflect proposed 2004 ANSI Standards format recommendations for 2007 implementation.

1/14/09 Reviewed with no changes.

6/21/2012 Document updated

Key/Legend

LVP-VOC: Low Vapor Pressure -Volatile Organic Compound (California)

Contact: Product Compliance Officer

Contact Phone: (800) 242-2271

This is the end of MSDS #: SK-117D

LOCTITE 495



Revision Date: 05/02/2007

Issue date: 05/02/2007

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name: 495(TM) Super Bonder® Instant Adhesive	Item No. : 49561 / IDH No. 209591
Product Use: Adhesive	Region: Canada
Company address: Henkel Canada Corporation 2225 Meadowpine Boulevard Mississauga, Ontario L5N 7P2	Contact Information: Telephone: (905) 814-6511 Emergency telephone: (905) 814-6511 Internet: www.loctite.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Hazardous components</u>	<u>%</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER</u>
Ethyl cyanoacrylate 7085-85-0	60-100	0.2 ppm TWA	None	None

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Physical state: Liquid	WHMIS hazard class: B.3, D.2.B
Color: Clear Colorless to Straw	
Odor: Sharp Irritating	

WARNING: BONDS SKIN IN SECONDS.
MAY CAUSE EYE AND RESPIRATORY IRRITATION.
COMBUSTIBLE LIQUID AND VAPOR.

Relevant routes of exposure: Skin, Inhalation, Eyes

Potential Health Effects

Inhalation:	Exposure to vapors above the established exposure limit results in respiratory irritation which may lead to difficulty in breathing and tightness in the chest.
Skin contact:	Bonds skin in seconds. May cause skin irritation. Cyanoacrylates have been reported to cause allergic reaction but due to rapid polymerization at the skin surface, an allergic response is rare. Cyanoacrylates generate heat on solidification. In rare circumstances a large drop will burn the skin. Cured adhesive does not present a health hazard even if bonded to the skin.
Eye contact:	Irritating to eyes. Causes excessive tearing. Eyelids may bond.
Ingestion:	Not expected to be harmful by ingestion. Rapidly polymerizes (solidifies) and bonds in mouth. It is almost impossible to swallow.

Existing conditions aggravated by exposure: Eye, skin, and respiratory disorders.

See Section 11 for additional toxicological information.

4. FIRST AID MEASURES

Inhalation:	Remove to fresh air. If discomfort persists seek medical attention.
Skin contact:	Do not pull bonded skin apart. Soak in warm soapy water. Gently peel apart using a blunt instrument. If skin is burned due to the rapid generation of heat by a large drop, seek medical attention. If lips are bonded, apply warm water to the lips and encourage wetting and pressure from saliva in mouth. Peel or roll lips apart. Do not pull lips apart with direct opposing force.
Eye contact:	Immediately flush with plenty of water for at least 15 minutes. Get medical attention. If eyelids are bonded closed, release eyelashes with warm water by covering with a wet pad. Do not force eye open. Cyanoacrylate will bond to eye protein and will cause a lachrymatory effect which will help to debond the adhesive. Keep eye covered until debonding is complete, usually within 1-3 days. Medical attention should be sought in case solid particles of polymerized cyanoacrylate trapped behind the eyelid caused abrasive damage.
Ingestion:	Ensure breathing passages are not obstructed. The product will polymerize rapidly and bond to the mouth making it almost impossible to swallow. Saliva will separate any solidified product in several hours. Prevent the patient from swallowing any separated mass.
Notes to physician:	Surgery is not necessary to separate accidentally bonded tissues. Experience has shown that bonded tissues are best treated by passive, non-surgical first aid. If rapid curing has caused thermal burns they should be treated symptomatically after adhesive is removed.

5. FIRE-FIGHTING MEASURES

Flash point:	80°C (176°F) to 93.4°C (200°F) Tagliabue closed cup
Autoignition temperature:	485°C (905°F)
Flammable/Explosive limits-lower %:	Not determined
Flammable/Explosive limits-upper %:	Not determined
Extinguishing media:	Water spray. Dry powder. Foam. Carbon dioxide.
Special fire fighting procedures:	Fire fighters should wear positive pressure self-contained breathing apparatus (SCBA).
Unusual fire or explosion hazards:	None
Hazardous combustion products:	Trace amounts of toxic and/or irritating fumes may be released and the use of breathing apparatus is recommended.
Sensitivity to mechanical impact:	Not available.
Sensitivity to static discharge:	Not available.

6. ACCIDENTAL RELEASE MEASURES

Environmental precautions:	Ventilate area. Prevent product from entering the drains.
Clean-up methods:	Do not use cloths for mopping up. Flood with water to complete polymerization and scrape off the floor. Cured material can be disposed of as non-hazardous waste.

7. HANDLING AND STORAGE

- Handling:** Avoid contact with eyes, skin and clothing. Avoid breathing vapor and mist. Wash thoroughly after handling. Avoid contact with fabric or paper goods. Contact with these materials may cause rapid polymerization which can generate smoke and strong irritating vapors, and cause thermal burns.
- Storage:** Keep in a cool, well ventilated area away from heat, sparks and open flame. Keep container tightly closed until ready for use.
- Incompatible products:** No special restrictions on storage with other products.

For information on product shelf life contact Henkel Canada Customer Service at (905) 814-6511.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

- Engineering controls:** Use positive down-draft exhaust ventilation if general ventilation is insufficient to maintain vapor concentration below established exposure limits.
- Respiratory protection:** Use NIOSH approved respirator if there is potential to exceed exposure limit(s). Observe OSHA regulations for respiratory use (29 CFR 1910.134).
- Skin protection:** Use nitrile gloves and aprons as necessary to prevent contact. Do not use PVC, nylon or cotton.
- Eye/face protection:** Chemical splash goggles or safety glasses with side shields.

See Section 2 for exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Color:	Clear Colorless to Straw
Odor:	Sharp, Irritating
Odor Threshold:	1-2 ppm
Vapor pressure:	Less than 0.2 mm Hg
pH:	Not applicable
Boiling point/range:	Greater than 149°C (300°F)
Melting point/range:	Not determined
Specific gravity:	1.1 at 23.9°C (75°F)
Vapor density:	Approximately 3
Evaporation rate:	Not available
Solubility in water:	Polymerizes in presence of water
Partition coefficient (n-octanol/water):	Not applicable
VOC content:	Less than 2%; 20 g/L (California SCAQMD Method 316B) (estimated)

10. STABILITY AND REACTIVITY

- Stability:** Stable under recommended storage conditions
- Hazardous polymerization:** Rapid exothermic polymerization will occur in the presence of water, amines, alkalis and alcohols.
- Hazardous decomposition products:** None
- Incompatibility:** Water, amines, alkalis and alcohols.
- Conditions to avoid:** Spontaneous polymerization

11. TOXICOLOGICAL INFORMATION

- Product toxicity data:** Acute oral LD50 >5000mg/kg (rat)(estimated). Acute dermal LD50 >2000mg/kg (rabbit)(estimated).
- Toxicologically synergistic products:** Not available.

Refer to the following for Irritancy of Product, Sensitization to Product, Carcinogenicity, Reproductive Toxicity, Teratogenicity, and Mutagenicity.

Ingredient Toxicity Data & Carcinogen Status

Hazardous components	LD50s & LC50s	Other LD50s and LC50s	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen	ACGIH - Carcinogens
Ethyl cyanoacrylate 7085-85-0	Oral LD50 (Rat) > 5 mL/kg	None	No	No	No	No

Literature Referenced Target Organ & Other Health Effects

Hazardous components	Health Effects/Target Organs
Ethyl cyanoacrylate 7085-85-0	Allergen, Irritant, Respiratory

12. ECOLOGICAL INFORMATION

Ecological information: Not known

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Dispose of in accordance with federal and local regulations.

14. TRANSPORT INFORMATION

Canada Transportation of Dangerous Goods - Ground:

Proper shipping name: Unrestricted
Hazard class or division: None
Identification number: None
Packing group: None

International Air Transportation (ICAO/IATA):

Proper shipping name: Aviation regulated liquids, n.o.s (Cyanoacrylate ester)
Hazard class or division: 9
Identification number: UN 3334
Packing group: None
Exceptions: (Not more than 500ml) Unrestricted

Water Transportation (IMO/MDG):

Proper shipping name: Unrestricted
Hazard class or division: None
Identification number: None
Packing group: None
Marine pollutant: None

15. REGULATORY INFORMATION

Canada Regulatory Information

CEPA DSL/NDL Status: All components are listed on or are exempt from listing on the Domestic Substances List.

United States Regulatory Information

TSCA 8 (b) Inventory Status: All components are listed or are exempt from listing on the Toxic Substances Control Act inventory.

16. OTHER INFORMATION

This material safety data sheet contains changes from the previous version in sections: Reviewed MSDS. Reissued with new date.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Product Regulations.

Prepared by: Regulatory Affairs

DISCLAIMER: The data contained herein are furnished for information only and are believed to be reliable. However, Henkel Corporation does not assume responsibility for any results obtained by persons over whose methods Henkel Corporation has no control. It is the user's responsibility to determine the suitability of Henkel's products or any production methods mentioned herein for a particular purpose, and to adopt such precautions as may be advisable for the protection of property and persons against any hazards that may be involved in the handling and use of any of Henkel Corporation's products. In light of the foregoing, Henkel Corporation specifically disclaims all warranties, express or implied, including warranties of merchantability and fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation further disclaims any liability for consequential or incidental damages of any kind, including lost profits.

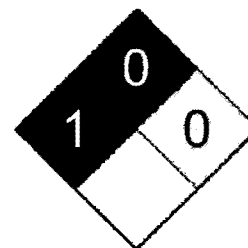
**LYSOL
DISINFECTING
WIPES**

1. Product and Company Identification

Product Name	LYSOL® Disinfecting Wipes (all sizes, all scents)
CAS #	Mixture
Product Use	Disinfectant
Distributed by	Reckitt Benckiser (Canada) Inc. 1680 Tech Avenue Unit #2 Mississauga, ON L4W 5S9 In Case of Emergency: 1-800-338-6167 Transportation Emergencies: 24 Hour Number: North America: CHEMTREC: 1-800-424-9300 Outside North America: 1-703-527-3887

LEGEND HMIS/NFPA	
Severe	4
Serious	3
Moderate	2
Slight	1
Minimal	0

Health	/ 1
Flammability	0
Reactivity	0
Personal Protection	A



2. Hazards Identification

Emergency Overview

This product is regulated by Health Canada as a disinfectant. Extensive testing has been completed to show that it is safe and effective when used as directed.

PRECAUTION:
CAUTION
 MAY CAUSE EYE IRRITATION. Avoid contact with eyes. Wash hands after use.

Keep out of reach of children.

Potential short term health effects

Routes of exposure	Eye, Skin contact, Inhalation, Ingestion.
Eyes	May cause eye irritation.
Skin	None expected during normal conditions of use. Not expected to be a skin sensitizer.
Inhalation	None expected during normal conditions of use.
Ingestion	Health injuries are not known or expected under normal use.
Target organs	Blood. Eyes. Liver. Respiratory system. Skin.
Chronic effects	The finished product is not expected to have chronic health effects.
Signs and symptoms	Symptoms may include redness, oedema, drying, defatting and cracking of the skin.
Potential environmental effects	See section 12.

3. Composition/Information on Ingredients

Ingredient(s)	CAS #	Percent
Alkyl (50%C14, 40%C12, 10%C16) dimethyl benzyl ammonium chlorides	Not Applicable	0.1 - 1
Ethanol	64-17-5	1 - 5

4. First Aid Measures

First aid procedures

Eye contact	Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
Skin contact	Wash hands thoroughly after handling. If skin irritation persists, call a physician.
Inhalation	Move to fresh air.

Ingestion	Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a physician or Poison Control Center IMMEDIATELY.
Notes to physician	Wipes are saturated with a solution containing less than 3% denatured ethyl alcohol.
General advice	Keep away from sources of ignition. No smoking. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Avoid contact with eyes and skin. Keep out of reach of children.
	Follow label directions carefully. Take container, label or product name and DIN Number with you when seeking medical attention.

5. Fire-fighting Measures

Flammable properties	The flashpoint of the liquid within this product is > 93.3°C (200°F) (Tagliabue).
Extinguishing media	
Suitable extinguishing media	Treat for surrounding material.
Unsuitable extinguishing media	Not available
Protection of firefighters	
Specific hazards arising from the chemical	Not available
Protective equipment for firefighters	Firefighters should wear full protective clothing including self contained breathing apparatus.
Hazardous combustion products	May include and are not limited to: Oxides of carbon. Oxides of nitrogen.
Explosion data	
Sensitivity to mechanical impact	Not available
Sensitivity to static discharge	Not available

6. Accidental Release Measures

Personal precautions	Avoid contact with eyes. Keep unnecessary personnel away. Do not touch or walk through spilled material. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep people away from and upwind of spill/leak.
Environmental precautions	Do not discharge into lakes, streams, ponds or public waters.
Methods for containment	Do not allow product to enter sewer or waterways.
Methods for cleaning up	Remove sources of ignition. Never return spills in original containers for re-use.
Other Information	Pick up and discard towel.

7. Handling and Storage

Handling	Avoid contact with eyes. Wash hands after handling and before eating. Use good industrial hygiene practices in handling this material. Food contact surfaces must be rinsed with potable water. Not recommended for polished or bare wood floors. Not intended for personal hygiene.
Storage	Store in original container out of reach of small children. Keep securely closed in a cool, well ventilated area. Do not reuse empty container. Rinse and discard or recycle. Do not store at temperatures above 120°F (49°C). It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

8. Exposure Controls / Personal Protection

Exposure limit values

Ingredient(s)	Exposure limit values
---------------	-----------------------

Alkyl (50%C14, 40%C12, 10%C16) dimethyl benzyl ammonium chlorides	ACGIH-TLV Not established
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Ethanol	ACGIH-TLV TWA: 1000 ppm STEL: 1000 ppm
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Engineering controls General ventilation normally adequate.

Personal protective equipment

Eye/Face protection Avoid contact with eyes.
Emergency responders should wear full eye and face protection.

Hand protection Wash hands after use.
Emergency responders should wear impermeable gloves.

Skin and body protection As required by employer code.
Emergency responders should wear impermeable clothing and footwear when responding to a situation where contact with the liquid is possible.

Respiratory protection Not normally required under normal use conditions.
Emergency responders should wear self-contained breathing apparatus (SCBA) to avoid inhalation of vapours generated by this product during a spill or other clean-up operations.

General hygiene considerations Handle in accordance with good industrial hygiene and safety practice.
When using do not eat or drink.
Washing with soap and water after use is recommended as good hygienic practice to prevent possible eye irritation from hand contact.

9. Physical and Chemical Properties

Appearance	Liquid saturated on wipe
Colour	clear liquid
Form	Pre-moistened towelette.
Odour	Various
Odour threshold	Not available
Physical state	Not available
pH	10.5 (liquid)
Freezing point	Not available
Boiling point	Not available
Pour point	Not available
Evaporation Rate	Not available
Flash point	> 93.33 °C (> 200 °F) (liquid) Tagliabue
Auto-ignition temperature	Not available
Flammability limits in air, lower, % by volume	Not available
Flammability Limits in Air, Upper, % by Volume	Not available
Vapour pressure	Not available
Vapour density	Not available
Specific gravity	0.99 (liquid)
Octanol/water coefficient	Not available
Solubility (H2O)	Wipe is not soluble

10. Stability and Reactivity

Reactivity	This product may react with strong oxidizing agents.
Possibility of hazardous reactions	Hazardous polymerisation does not occur.
Chemical stability	Stable under recommended storage conditions.

Conditions to avoid	DO NOT MIX WITH BLEACH or use in conjunction with other household products. Heat, open flames, static discharge, sparks and other ignition sources.
Incompatible materials	Oxidizers.
Hazardous decomposition products	May include and are not limited to: Oxides of carbon. Oxides of nitrogen.

11. Toxicological Information

Component analysis - LC50

Ingredient(s)	LC50
Alkyl (50%C14, 40%C12, 10%C16) dimethyl benzyl ammonium chlorides	Not available
Ethanol	31623 ppm rat

Component analysis - Oral LD50

Ingredient(s)	LD50
Alkyl (50%C14, 40%C12, 10%C16) dimethyl benzyl ammonium chlorides	426 mg/kg rat
Ethanol	3450 mg/kg mouse; 7060 mg/kg rat

Effects of acute exposure

Eye	May cause eye irritation.
Skin	None expected during normal conditions of use. Not expected to be a skin sensitizer.
Inhalation	None expected during normal conditions of use.
Ingestion	Health injuries are not known or expected under normal use.
Sensitisation	The finished product is not expected to have chronic health effects.
Chronic effects	The finished product is not expected to have chronic health effects.
Carcinogenicity	The finished product is not expected to have chronic health effects.
ACGIH - Threshold Limit Values - Carcinogens	
Ethanol	64-17-5 A3 - Confirmed animal carcinogen with unknown relevance to humans.
Mutagenicity	The finished product is not expected to have chronic health effects.
Reproductive effects	The finished product is not expected to have chronic health effects.
Teratogenicity	The finished product is not expected to have chronic health effects.
Name of Toxicologically Synergistic Products	Not available

12. Ecological Information

Ecotoxicity	Components of this product have been identified as having potential environmental concerns.	
Ecotoxicity - Freshwater Fish - Acute Toxicity Data		
Ethanol	64-17-5	96 Hr LC50 Oncorhynchus mykiss: 12.0 - 16.0 mL/L [static]; 96 Hr LC50 Pimephales promelas: >100 mg/L [static]; 96 Hr LC50 Pimephales promelas: 13400 - 15100 mg/L [flow-through]
Ecotoxicity - Water Flea - Acute Toxicity Data		
Ethanol	64-17-5	48 Hr LC50 Daphnia magna: 9268 - 14221 mg/L; 24 Hr EC50 Daphnia magna: 10800 mg/L; 48 Hr EC50 Daphnia magna: 2 mg/L [Static]
Persistence and degradability	Not available	
Bioaccumulation/accumulation	Not available	
Mobility in environmental media	Not available	
Environmental effects	Not available	
Aquatic toxicity	Not available	
Partition coefficient	Not available	
Chemical fate information	Not available	
Other adverse effects	Not available	

13. Disposal Considerations

Disposal instructions	Dispose of wipe in trash after use. Throw used towelette in the trash. Do not re-use empty container. Rinse and dispose. Recycle where facilities exist. Dispose in accordance with all applicable regulations.
Waste from residues / unused products	Not available
Contaminated packaging	Not available

14. Transport Information

U.S. Department of Transportation (DOT)
UN/ID N.o. Not applicable

U.S. Department of Transportation (DOT): Classification: Not regulated

Proper shipping name	Not applicable
U.S. DOT Hazard Class	Not applicable
Subsidiary Risk	Not applicable
Packing group	Not applicable
DOT RQ (lbs)	Not applicable
ERG NO	Not applicable

Transportation of Dangerous Goods (TDG - Canada): Classification: Not regulated

Proper shipping name	Not applicable
Status	Not applicable
Packing group	Not applicable

IMDG (Marine Transport): Classification: Not regulated

Proper shipping name	Not applicable
Class	Not applicable
Subsidiary Risk	Not applicable
Packing group	Not applicable
IMDG Page	Not applicable
Marine pollutant	Not applicable
EMS	Not applicable
MFAG	Not applicable
Maximum Quantity	Not applicable

IATA/ICAO (Air): Classification: Not regulated

Proper shipping name Not applicable
Class Not applicable
Subsidiary Risk: Not applicable
Packing group Not applicable
Maximum Quantity Not applicable

15. Regulatory Information

Canadian federal regulations This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Product Registration: Registered with TPD, DIN 02359014

Canada - WHMIS - Ingredient Disclosure List

Ethanol 64-17-5 0.1 %

WHMIS classification Exempt - Registered product - (DIN 02359014)

Inventory Status

Country(s) or region	Inventory Name	On Inventory (Yes/No)*
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	No

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

16. Other Information

Disclaimer This product should only be used as directed on the label and for the purpose intended. 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.

Further information LYSOL® Disinfecting Wipes - Citrus 70, 80 ct. - 0314170 v1.0
LYSOL® Disinfecting Wipes - Crisp Linen 35, 70 ct. - 0318913 v1.0
LYSOL® Disinfecting Wipes - Green Apple 35 ct. - 0318901 v1.0
LYSOL® Disinfecting Wipes - Spring Waterfall 35, 70 ct. - 0209440 v2.0
LYSOL® Disinfecting Wipes XL - Citrus 24 ct. - 0314170 v1.0

Issue date 29-Feb-2012
Effective Date 01-Mar-2012
Expiry Date 01-Mar-2015
Prepared by Reckitt Benckiser Regulatory Department 800-333-3899
Other Information For an updated MSDS, please contact the supplier/manufacturer listed on the first page of the document.

**LYSOL TOILET
BOWL
CLEANER**

1. Product and Company Identification

Product Name LYSOL® Disinfectant Toilet Bowl Cleaner Power - Complete Clean
CAS # Mixture

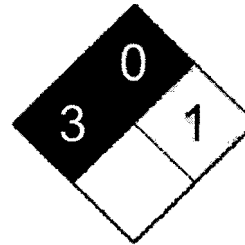
This MSDS is designed for workplace employees, emergency personnel and for other conditions and situations where there is a greater potential for large-scale or prolonged exposure, in accordance with requirements of the Canadian Workplace Hazardous Materials Information System (WHMIS). This MSDS is not applicable for consumer use of our products. For consumer use, all precautionary and first aid language is provided on the product label in accordance with the applicable government regulation.

Product Use Toilet bowl cleaner

Distributed by Reckitt Benckiser (Canada) Inc.
 1680 Tech Avenue Unit #2
 Mississauga, ON L4W 5S9
 In Case of Emergency: 1-800-338-6167
 Transportation Emergencies: 24 Hour Number:
 North America: CHEMTREC: 1-800-424-9300
 Outside North America: 1-703-527-3887

LEGEND HMIS/NFPA	
Severe	4
Serious	3
Moderate	2
Slight	1
Minimal	0

Health	/ 3
Flammability	0
	1
Personal Protection	D



2. Hazards Identification

Emergency Overview DANGER
 CORROSIVE TO EYES AND SKIN
 HARMFUL OR FATAL IF SWALLOWED.
 Avoid contact with eyes, skin or clothing.
 DO NOT breathe vapour.
 DO NOT mix with bleach or other chlorinating compounds.
 This product should not be used or placed on toilet lids, vanities, sinks, bathtubs, cabinets, countertops, rugs, floors, etc.

Keep out of reach of children.

Potential short term health effects

Routes of exposure Eye, Skin contact, Inhalation, Ingestion.

Eyes Corrosive to the eyes and may cause severe damage including blindness.

Skin Corrosive to skin.
 Not expected to be a skin sensitizer.

Inhalation Do not breathe vapours or fumes from the drain.

Ingestion Harmful or fatal if swallowed.

Target organs Eyes. Respiratory system. Skin.

Chronic effects Prolonged or repeated exposure to dilutions can cause drying, defatting and dermatitis.

Signs and symptoms The product causes burns of eyes, skin and mucous membranes.

Potential environmental effects See section 12.

3. Composition/Information on Ingredients

Ingredient(s)	CAS #	Percent
Methyl salicylate	119-36-8	0.1 - 1
Ethoxylated aliphatic amines	61791-26-2	1 - 5
Alcohols, C12-16, ethoxylated	68551-12-2	1 - 5
Hydrochloric acid	7647-01-0	7 - 13

4. First Aid Measures

First aid procedures

Eye contact	If splashed in eyes, immediately flush eyes thoroughly with water. Remove any contact lenses and continue to flush eyes with water for 15 minutes. Get medical attention immediately.
Skin contact	If splashed on skin, immediately flush with soap and water. Get medical attention if irritation persists.
Inhalation	Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice.
Ingestion	If swallowed, give three to four glasses of water. Do not induce vomiting. Call physician or Poison Control Centre IMMEDIATELY.
Notes to physician	If the product is ingested, probable mucosal damage may contraindicate the use of gastric lavage. Treat the affected person appropriately. Symptoms may be delayed.
General advice	If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Avoid contact with eyes and skin. Keep out of reach of children.

5. Fire-fighting Measures

Flammable properties	Not flammable by WHMIS criteria.
Extinguishing media	
Suitable extinguishing media	Dry chemical. Water spray. Foam.
Unsuitable extinguishing media	Not available
Protection of firefighters	
Specific hazards arising from the chemical	Not available
Protective equipment for firefighters	Firefighters should wear full protective clothing including self contained breathing apparatus.
Hazardous combustion products	May include and are not limited to: Hydrogen chloride. Oxides of carbon. Oxides of nitrogen.
Explosion data	
Sensitivity to mechanical impact	Not available
Sensitivity to static discharge	Not available

6. Accidental Release Measures

Personal precautions	Keep unnecessary personnel away. Do not touch or walk through spilled material. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep people away from and upwind of spill/leak.
Environmental precautions	Do not discharge into lakes, streams, ponds or public waters. Advise authorities if product has penetrated drains, sewers or water pipes.
Methods for containment	Stop leak if you can do so without risk. Prevent entry into waterways, sewers, basements or confined areas.
Methods for cleaning up	Before attempting clean up, refer to hazard data given above. Small spills may be absorbed with non-reactive absorbent and placed in suitable, covered, labelled containers. Prevent large spills from entering sewers or waterways. Contact emergency services and supplier for advice. Never return spills in original containers for re-use. Large Spills: Wet down with water and dike for later disposal. After removal flush contaminated area thoroughly with water.

7. Handling and Storage

Handling	Ensure adequate ventilation. Avoid contact with eyes, skin or clothing. DO NOT breathe vapour. Do not ingest. Use good industrial hygiene practices in handling this material. Wash thoroughly with soap and water after handling. Read and follow product label instructions.
Storage	Store in original container out of reach of small children. Keep securely closed in a cool, well ventilated area. DO NOT reuse empty container. Rinse and discard or offer for recycling where facilities exist. Keep out of reach of children.

8. Exposure Controls / Personal Protection

Exposure limit values

Ingredient(s)	Exposure limit values
Alcohols, C12-16, ethoxylated	ACGIH-TLV Not established
Ethoxylated aliphatic amines	ACGIH-TLV Not established
Hydrochloric acid	ACGIH-TLV Ceiling: 2 ppm
Methyl salicylate	ACGIH-TLV Not established

Engineering controls

General ventilation normally adequate.

Personal protective equipment

Consult the product label for special protection or precautions that have been identified for using this product under directed consumer use conditions. The following recommendations are given for workplace employees, emergency personnel and for other conditions and situations where there is a greater potential for large-scale or prolonged exposure.

Eye / face protection

Wear chemical goggles.
Emergency responders should wear full eye and face protection.

Hand protection

Rubber gloves. Confirm with a reputable supplier first.
Emergency responders should wear impermeable gloves.

Skin and body protection

Usual safety precautions while handling the product will provide adequate protection against injury or irritation. Follow label directions carefully.
In case of continuous exposure or occupational operations, wear protective clothing designed and appropriate for acid chemical exposure.
Emergency responders should wear impermeable clothing and footwear when responding to a situation where contact with the liquid is possible.

Respiratory protection

Where exposure guideline levels may be exceeded, use an approved NIOSH respirator.
Emergency responders should wear self-contained breathing apparatus (SCBA) to avoid inhalation of vapours generated by this product during a spill or other clean-up operations.

General hygiene considerations

Handle in accordance with good industrial hygiene and safety practice.
When using do not eat or drink.
Wash hands before breaks and immediately after handling the product.
Avoid contact with skin, eyes and clothing.

9. Physical and Chemical Properties

Appearance	Clear
Colour	Blue
Form	Liquid
Odour	Wintergreen
Odour threshold	Not available
Physical state	Liquid

pH	< 1 (Acidic)
Freezing point	Not available
Boiling point	Not available
Pour point	Not available
Evaporation Rate	Not available
Flash point	> 93.33 °C (> 200 °F) Tagliabue
Auto-ignition temperature	Not available
Flammability limits in air, lower, % by volume	Not available
Flammability Limits in Air, Upper, % by Volume	Not available
Vapour pressure	Not available
Vapour density	Not available
Specific gravity	1.040 - 1.050
Octanol/water coefficient	Not available
Solubility (H2O)	Complete
Viscosity	Viscous

10. Stability and Reactivity

Reactivity	This product may react with strong oxidizing agents.
Possibility of hazardous reactions	Hazardous polymerisation does not occur.
Chemical stability	Stable under recommended storage conditions.
Conditions to avoid	Do not mix with other chemicals. Reacts violently with alkaline material. This product may react with reducing agents. Fumes are corrosive to metal. Excessive heat and moisture. DO NOT MIX WITH BLEACH or use in conjunction with other household products.
Incompatible materials	Bases. Reducing agents.
Hazardous decomposition products	May include and are not limited to: Hydrogen chloride. Oxides of nitrogen. Oxides of carbon.

11. Toxicological Information

Component analysis - LC50

Ingredient(s)	LC50
Alcohols, C12-16, ethoxylated	Not available
Ethoxylated aliphatic amines	Not available
Hydrochloric acid	554 ppm mouse
Methyl salicylate	Not available

Component analysis - Oral LD50

Ingredient(s)	LD50
Alcohols, C12-16, ethoxylated	1380 mg/kg rat
Ethoxylated aliphatic amines	620 mg/kg rat
Hydrochloric acid	900 mg/kg rabbit; 700 mg/kg rat
Methyl salicylate	887 mg/kg rat; 1110 mg/kg mouse; 2100 mg/kg dog; 1300 mg/kg rabbit; 700 mg/kg guinea pig

Effects of acute exposure

Eye	Corrosive to the eyes and may cause severe damage including blindness.
Skin	Corrosive to skin. Not expected to be a skin sensitizer.
Inhalation	Do not breathe vapours or fumes from the drain.
Ingestion	Harmful or fatal if swallowed.
Sensitisation	The finished product is not expected to have chronic health effects.
Chronic effects	The finished product is not expected to have chronic health effects.

Carcinogenicity	The finished product is not expected to have chronic health effects.
Mutagenicity	The finished product is not expected to have chronic health effects.
Reproductive effects	The finished product is not expected to have chronic health effects.
Teratogenicity	The finished product is not expected to have chronic health effects.
Name of Toxicologically Synergistic Products	Not available

12. Ecological Information

Ecotoxicity	Bulk quantities, if spilled, may be toxic to aquatic organisms, fish, birds and mammals. Control and clean up all exterior spills and prevent liquid from entering any streams, rivers, lakes and all other bodies of water.	
	Ecotoxicity - Freshwater Fish - Acute Toxicity Data	
	Hydrochloric acid 7647-01-0	96 Hr LC50 <i>Gambusia affinis</i> : 282 mg/L [static]
	Ecotoxicity - Water Flea - Acute Toxicity Data	
	Methyl salicylate 119-36-8	24 Hr EC50 <i>Daphnia magna</i> : 50 mg/L
Persistence and degradability	Not available	
Bioaccumulation/accumulation	Not available	
Mobility in environmental media	Not available	
Environmental effects	Not available	
Aquatic toxicity	Not available	
Partition coefficient	Not available	
Chemical fate information	Not available	
Other adverse effects	Not available	

13. Disposal Considerations

Disposal instructions	Dispose in accordance with all applicable regulations. DO NOT reuse empty container. Rinse and discard or offer for recycling where facilities exist. Large quantities of waste liquid: Contain and collect for evaluation and disposal according to local, state, provincial and federal regulations.
Waste from residues / unused products	Not available
Contaminated packaging	Not available

14. Transport Information

U.S. Department of Transportation (DOT)

UN 1760, Corrosive Liquid, N.O.S. (Hydrochloric acid, Hydroxyethyl alkylamine) Class 8, PG II, Limited Quantity

Transportation of Dangerous Goods (TDG - Canada)

UN 1760, Corrosive Liquid, N.O.S. (Hydrochloric acid, Hydroxyethyl alkylamine) Class 8, PG II, Limited Quantity

IMDG (Marine Transport)

UN 1760, Corrosive Liquid, N.O.S. (Hydrochloric acid, Hydroxyethyl alkylamine) Class 8, PG II, Limited Quantity

IATA/ICAO (Air)

UN 1760, Corrosive Liquid, N.O.S. (Hydrochloric acid, Hydroxyethyl alkylamine) Class 8, PG II

15. Regulatory Information

Canadian federal regulations

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Product Registration: Registered with TPD, DIN 02275465

Canada - WHMIS - Ingredient Disclosure List

Hydrochloric acid	7647-01-0	1 %
Methyl salicylate	119-36-8	0.1 %

WHMIS classification

Exempt - Registered product - (DIN 02275465)

Inventory Status

Country(s) or region	Inventory Name	On Inventory (Yes/No)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

16. Other Information

Disclaimer

This product should only be used as directed on the label and for the purpose intended. 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.

Further information

LYSOL® Disinfectant Toilet Bowl Cleaner Power - Complete Clean, 710 mL/ 946 mL - 0259960v1.0

Issue date

25-Feb-2013

Effective Date

15-Sept-2012

Expiry Date

15-Sept-2015

Prepared by

Reckitt Benckiser Regulatory Department 800-333-3899

Other Information

For an updated MSDS, please contact the supplier/manufacturee listed on the first page of the document.

**NAPA WHEEL
BEARING
GREASE**

NAPA® MPURP WHEEL BEARING GREASE
GREASE
3086

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Ashland	Regulatory Information Number	1-800-325-3751
P.O. Box 2219	Telephone	614-790-3333
Columbus, OH 43216	Emergency telephone number	1-800-ASHLAND (1-800-274-5263)

Product name	NAPA® MPURP WHEEL BEARING GREASE GREASE
Product code	3086
Product Use Description	No data

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance: solid, amber

CAUTION! PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE IRRITATION.

Potential Health Effects

Exposure routes

Inhalation, Skin contact, Eye Contact, Ingestion

Eye contact

May cause mild eye irritation. Symptoms include stinging, tearing, and redness.

Skin contact

May cause skin irritation. Symptoms may include redness, burning, and swelling of skin.

Ingestion

Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.

Inhalation

NAPA® MPURP WHEEL BEARING GREASE
GREASE
3086

It is possible to breathe this material under certain conditions of handling and use (for example, during heating, spraying, or stirring). Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms are not expected at air concentrations below the recommended exposure limits, if applicable (see Section 8.).

Aggravated Medical Condition

Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material: Skin, lung (for example, asthma-like conditions)

Symptoms

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways)

Target Organs

No data

Carcinogenicity

This material is not listed as a carcinogen by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or the Occupational Safety and Health Administration (OSHA).

Reproductive hazard

There are no data available for assessing risk to the fetus from maternal exposure to this material.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Components	CAS-No.	Concentration
OCTADECANOIC ACID, 12-HYDROXY-, MONOLITHIUM SALT	7620-77-1	>=10-<15%
ZINC COMPOUNDS	68649-42-3	>=1.5-<5%

4. FIRST AID MEASURES

Eyes

NAPA® MPURP WHEEL BEARING GREASE
GREASE
3086

If symptoms develop, move individual away from exposure and into fresh air. Flush eyes gently with water while holding eyelids apart. If symptoms persist or there is any visual difficulty, seek medical attention.

Skin

Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse. Hydrocarbons injected into the skin under pressure can cause severe injury. In the event of a high pressure injection injury, worker should obtain immediate medical assistance.

Ingestion

Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation

If symptoms develop, move individual away from exposure and into fresh air. If symptoms persist, seek medical attention. If breathing is difficult, administer oxygen. Keep person warm and quiet; seek immediate medical attention.

Notes to physician

Hazards: Acute aspiration of large amounts of oil-laden material may produce a serious aspiration pneumonia. Patients who aspirate these oils should be followed for the development of long-term sequelae. Repeated aspiration of small quantities of mineral oil can produce chronic inflammation of the lungs (i.e. lipoid pneumonia) that may progress to pulmonary fibrosis. Symptoms are often subtle and radiological changes appear worse than clinical abnormalities. Occasionally, persistent cough, irritation of the upper respiratory tract, shortness of breath with exertion, fever, and bloody sputum occur. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities.

Treatment: No information available.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Water spray, Foam, Dry chemical, Carbon dioxide (CO2)

Hazardous combustion products

NAPA® MPURP WHEEL BEARING GREASE
GREASE
3086

carbon dioxide and carbon monoxide, hydrogen sulfide, zinc oxide, oxides of sulfur, nitrogen and phosphorus, Amines

Precautions for fire-fighting

Wear full firefighting turn-out gear (full Bunker gear), and respiratory protection (SCBA). DO NOT direct a solid stream of water or foam into hot, burning pools of liquid since this may cause frothing and increase fire intensity. Frothing can be violent and possibly endanger any firefighter standing too close to the burning liquid. Use water spray to cool fire exposed containers and structures until fire is out if it can be done with minimal risk. Avoid spreading burning material with water used for cooling purposes.

NFPA Flammable and Combustible Liquids Classification

Combustible Liquid Class IIIB

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

For personal protection see section 8. Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.

Environmental precautions

Do not flush into surface water or sanitary sewer system.

Methods for cleaning up

Shovel material into containers and apply oil absorbing material to effect complete clean-up.

Other information

Comply with all applicable federal, state, and local regulations.

7. HANDLING AND STORAGE

Handling

Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed.

Storage

Store in a cool, dry, ventilated area.

NAPA® MPURP WHEEL BEARING GREASE
GREASE
3086

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

General advice

These recommendations provide general guidance for handling this product. Personal protective equipment should be selected for individual applications and should consider factors which affect exposure potential, such as handling practices, chemical concentrations and ventilation. It is ultimately the responsibility of the employer to follow regulatory guidelines established by local authorities.

Exposure controls

General room ventilation should be adequate for normal conditions of use. However, if unusual operating conditions exist, provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected or apparent adverse effects.

Eye protection

Wear chemical splash goggles when there is the potential for exposure of the eyes to liquid, vapor or mist.

Skin and body protection

Wear resistant gloves such as:

Neoprene

Wear normal work clothing including long pants, long-sleeved shirts and foot covering to prevent direct contact of the product with the skin. Launder clothing before reuse. If skin irritation develops, contact your facility health and safety professional or your local safety equipment supplier to determine the proper personal protective equipment for your use.

Respiratory protection

Respiratory protection is not required under normal conditions of use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	solid
Form	gel
Colour	amber
Odour	no data available

NAPA® MPURP WHEEL BEARING GREASE
GREASE
3086

Boiling point/boiling range	no data available
Melting point/range	no data available
Sublimation point	no data available
pH	no data available
Flash point	450 °F / 232 °C
Ignition temperature	no data available
Evaporation rate	no data available
Lower explosion limit/Upper explosion limit	no data available
Particle size	no data available
Vapour pressure	< 0.010 mmHg @ 68 °F / 20 °C
Relative vapour density	no data available
Density	0.86 g/cm ³ @ 60.1 °F / 15.6 °C
Bulk density	No data
Water solubility	negligible
Solubility(ies)	no data available
Partition coefficient: n-octanol/water	no data available
log Pow	no data available
Autoignition temperature	no data available
Viscosity, dynamic	no data available
Viscosity, kinematic	no data available
Solids in Solution	no data available
Decomposition temperature	no data available
Burning number	no data available
Dust explosion constant	no data available
Minimum ignition energy	no data available

10. STABILITY AND REACTIVITY

Stability

Stable.

Conditions to avoid

excessive heat

Incompatible products

Strong oxidizing agents

Hazardous decomposition products

carbon dioxide and carbon monoxide

NATURAL GAS, SOUR



Natural Gas Sour

Material Safety Data Sheet

1. Product and Company Identification

Product Name: Natural Gas, Sour
Synonym: Natural Gas, Raw Gas
Product use: Fuel, Petroleum Feedstock
Manufacturer: ARC Resources Ltd.
Address: Suite 2100, 440 2nd Street SW
Calgary, AB, T2P 5E9
Emergency Contact: 403-292-0434
Canutec: (613) 996-6666 or Cellular *666

2. Hazards Identification

EMERGENCY OVERVIEW

Danger!! This product is **extremely flammable** and will be easily ignited by heat, sparks or flames. Contains hydrogen sulphide that is an extremely toxic and flammable gas at low concentrations. Exposures to hydrogen sulphide above 100 ppm are immediately dangerous to life and health (IDLH) and may be fatal. Exposures to hydrogen sulphide between 10 ppm and 100 ppm may produce irritation to the respiratory tract. Explosive mixtures form when vapours mix with air. Vapors may travel to a source of ignition and flash back. Vapours may cause dizziness or asphyxiation and may be irritating if inhaled at high concentrations. Fire may produce irritating and/or toxic gases. At high concentrations, this product can displace air and cause suffocation from lack of oxygen. Direct contact with leaking gas may cause frostbite. Do not extinguish leaking gas flames unless gas source can be shut off. .

POTENTIAL HEALTH EFFECTS/ROUTES OF EXPOSURE

Eyes: This product is a moderate eye irritant. Direct contact with rapidly escaping gas may cause cryogenic (freezer) burns or frostbite. Vapors may cause irritation to the eyes, conjunctiva, and mucous membranes resulting in redness and tearing.

Skin: This product is a slight skin irritant. Direct contact with rapidly escaping gas may cause cryogenic (freezer) burns or frostbite. The appearance of injury may be delayed for a few hours, but may cause tissue to become swollen, discolored and extremely painful; permanent damage or death may result without adequate medical treatment.

Ingestion: Natural gas is extremely unlikely to be swallowed and much more likely to be inhaled.

Inhalation: Headaches, loss of appetite, drowsiness, nausea and vomiting, loss of consciousness and even death.

Warning: The burning of this product in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, carbon dioxide, sulphur dioxide and inadequate oxygen levels, which may cause irritation of the eyes, nose, throat and respiratory system as well as unconsciousness, suffocation, and even death.



3. Composition/Information on Ingredients

Ingredient Name	%	CAS No.
Natural Gas	100	8006-14-2
Methane	50-60	74-82-8
Ethane	5-10	74-84-0
Propane	3-7	74-98-6
n-Butane	1-3	106-97-8
iso-Butane	0-1	75-28-5
iso-Pentane	0-1	78-78-4
n-Pentane	0-1	109-66-0
Hydrogen Sulphide	1-30	7783-06-4

Natural Gas is a naturally occurring gaseous hydrocarbon used as a fuel. This product is a commingled stream from multiple petroleum facilities and is a complex mixture consistent with the definition within WHMIS regulation CPR section 2. The listed components are provided as guidance based on the available knowledge of the commingled stream.

4. First Aid Measures

- Eyes:** In case of contact with eyes, immediately flush with clean, low-pressure water for at least 20 minutes. Hold eyelids open to ensure adequate flushing. Seek medical attention immediately.
- Skin:** This material can cause drying and redness of the skin. High-pressure releases may inject gas under the skin and requires immediate medical attention.
- Ingestion:** This product is naturally a gas and is unlikely to be ingested and more likely to be inhaled. Rinse mouth with water. Do not induce vomiting. If conscious, give 1 – 2 glasses of milk or water to drink. Never administer liquids to an unconscious person. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Seek medical attention immediately and monitor for breathing difficulty.
- Inhalation:** Ensure your own safety and use the appropriate respiratory protection to immediately remove the victim to an uncontaminated area. Give CPR or artificial respiration as needed and give oxygen if breathing is difficult. Keep victim at rest and get immediate medical attention.

5. Fire Fighting Measures

FLAMMABLE PROPERTIES

Flammable Gas

HAZARDOUS COMBUSTION PRODUCTS:

Carbon dioxide, carbon monoxide and sulphur dioxide will be produced.



Natural Gas Sour

FIRE AND EXPLOSION HAZARDS

This product is EXTREMELY FLAMMABLE. DO NOT ATTEMPT TO EXTINGUISH A LEAKING GAS FIRE UNLESS THE LEAK CAN BE STOPPED. Vapors will ignite easily in the presence of any source of ignition over a wide range of concentrations and even at very low temperatures. Containers may explode when heated. Ruptured cylinders may rocket.

EXTINGUISHING MEDIA

Dry chemical, foam or CO₂ using the manufacturer's recommended technique. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers. Consider initial downwind evacuation for at least 800 meters (1/2 mile). Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Do not direct water at source of leak or safety devices as icing may occur. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. For massive fires, use unmanned hose holders or monitor nozzles. If this is impossible, withdraw from area and let fire burn.

FIRE FIGHTING INSTRUCTIONS

Small fires in the early stages may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. An approved self-contained breathing apparatus (SCBA) with full-face piece and full protective firefighting clothing must be worn. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water.

UNUSUAL FIRE & EXPLOSION HAZARDS:

This product is lighter than air and may collect in upper part of buildings. Burning occurs with slightly luminous flame and little noise. Containers of pressurized gasses may explode from heat generated by fires.

6. Accidental Release Measures

ACTIVATE SITE SPECIFIC EMERGENCY RESPONSE PLAN, IF AVAILABLE

Small Spills: Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Remove all ignition sources. Ventilate area of leak. Stop flow of gas. Do not attempt to extinguish a fire unless the leak can be stopped.

Large Spills: Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Isolate spill or leak area immediately for at least 50 to 100 meters (160 to 330 feet) in all directions. Keep unauthorized personnel away and stay upwind. Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). Keep out of low areas. The proper use of water spray may effectively disperse product vapours, preventing contact with ignition sources or areas/equipment that require protection. Do not discharge solid water stream pattern into the liquid resulting in splashing. Do not flush down sewer or drainage systems. Protect bodies of water by diking, if possible.

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

Attention: Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. The application of water and/or fire fighting foam may cause spilled liquids to generate increased amounts of vapours, particularly when the water/foam temperature is warmer than the liquid. However, this effect may be desirable under certain conditions to evaporate a spill quickly. Consideration



Natural Gas Sour

should be given to environmental clean-up and waste material generation when deciding if the use of large volumes of water is appropriate for non-fire emergency situations. Clean-up crews must be properly trained and must utilize proper protective equipment.

7. Handling and Storage

HANDLING PRECAUTIONS

Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Handle as a flammable gas. Keep away from all sources of heat, sparks, open flame or any sources of ignition as well as flammable materials or oxidizers. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition. Use only with adequate ventilation and avoid breathing vapours. Ground and bond all lines and equipment. Use intrinsically safe electrical equipment.

STORAGE PRECAUTIONS

Outside storage is recommended. Store in a cool, dry and well ventilated area out of sunlight and away from all sources of ignition. Avoid storage in low, confined locations or near incompatible materials such as other flammable materials, oxidizers or materials that support combustion. This storage area should comply with NFPA 30 ("Flammable and Combustible Liquid Code"). The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

SPECIAL PRECAUTIONS

Store away from oxidizers such as oxygen, chlorine, bromine and peroxides.

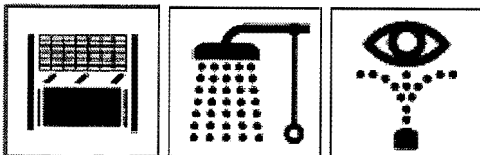
WORK/HYGIENIC PRACTICES

Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Use good personal hygiene practices. Avoid skin exposure and wash hands before eating, drinking, smoking, or using toilet facilities. Do not eat, drink or smoke in areas of use or storage. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapours which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

Exposure Limits

Ingredient Name	CAS No.	Exposure Limits
Natural Gas	8006-14-2	ACGIH TLV-TWA = 1,000 ppm
Methane	74-82-8	ACGIH TLV-TWA = 1,000 ppm (Alkane C1-C4)
Ethane	74-84-0	ACGIH TLV-TWA = 1,000 ppm (Alkane C1-C4)
Propane	74-98-6	ACGIH TLV-TWA = 1,000 ppm (Alkane C1-C4)
n-Butane	106-97-8	ACGIH TLV-TWA = 1,000 ppm (Alkane C1-C4)
iso-Butane	75-28-5	ACGIH TLV-TWA = 1,000 ppm (Alkane C1-C4)
iso-Pentane	78-78-4	ACGIH TLV-TWA = 600 ppm
n-Pentane	109-66-0	ACGIH TLV-TWA = 600 ppm
Hydrogen Sulphide	7783-06-4	ACGIH TLV-TWA = 10 ppm ACGIH TLV-STEL = 15 ppm

8. Exposure Controls / Personal Protection



ENGINEERING CONTROLS

Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Ensure adequate ventilation to keep vapour and gas concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces. Ventilation system and other equipment must be intrinsically safe. Quick drench facilities and/or eyewash fountains should be provided within the immediate work area for emergency use when there is any possibility of exposure to liquids that are extremely cold or rapidly evaporating.



in emergencies



PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: Wear safety glasses with side shields, chemical goggles or a full-face shield to avoid burns or tissue damage from frostbite.

Skin Protection: Avoid skin contact. Wear fire retardant clothing and insulated chemical resistant gloves in order to prevent the potential of frostbite or cryogenic burns.

Respiratory Protection: This product is a known asphyxiant and air supplied respirators are required if there is a potential for decreased oxygen concentrations. Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece must be worn if the concentration exceeds the OEL (Occupational Exposure Limit) of hydrogen sulphide or LELs. When assessing the proper type of respiratory protection, also consider the occupational exposure limits applicable to individual ingredients. Refer to CSA Standard "Selection, Use and Care of Respirators" (Z94.4-02) and NIOSH Respirator Decision Logic for additional guidance on respiratory protection.

9. Physical and Chemical Properties

Appearance and state:	Colourless gas
Odour:	A foul rotten egg odour.
Odour Threshold:	0.05 ppm (Hydrogen Sulphide)
Flash Point:	-156°C (Tagliabue CC) Flammable Gas
Auto Ignition:	537°C (999°F)
Lower Explosive Limit (%):	5%
Upper Explosive Limit (%):	15%
Boiling Point:	-161.4°C



Natural Gas Sour

Melting Point:	-182.6°C
Vapour Pressure:	47000 mmHg @ 25 °C
Vapour Density (Air = 1):	0.554
Specific Gravity:	0.7168
Solubility (H ₂ O):	Slightly soluble
Percent Volatiles:	100%
Evaporation Rate:	Not Applicable gas
Octanol/Water Coefficient:	log Kow = 1.09

10. Stability and Reactivity

STABILITY

Stable

CONDITIONS TO AVOID (STABILITY)

Material is stable under normal conditions but will rapidly volatilize. Avoid high temperatures, open flames, sparks, welding, smoking and other ignitions sources.

INCOMPATIBLE MATERIALS

Avoid contact with strong oxidizers, ignition sources and heat.

HAZARDOUS DECOMPOSITION PRODUCTS

Irritating or toxic substances may be emitted upon thermal decomposition. Decomposition products include carbon dioxide and carbon monoxide.

HAZARDOUS POLYMERIZATION

Will Not Occur.

11. Toxicological Information

Chemical Name	CAS No.	LD50	LC50
Natural Gas	8006-14-2	Not applicable	Not available
Methane	74-82-8	Not applicable	Not available
Ethane	74-84-0	Not applicable	Not available
Propane	74-98-6	Not applicable	Not available
Ethane	74-84-0	Not applicable	Not available
n-Butane	106-97-8	Not applicable	658mg/l rat
iso-Butane	75-28-5	Not applicable	Not available
n-Pentane	109-66-0	Mouse (ivn): 446 mg/kg	Rat: 364 gm/m ³ (4Hr)
Hydrogen Sulphide	7783-06-4	Not applicable	Rat inhalation 380 mg/ cu m > 960 min

POTENTIAL HEALTH EFFECTS

Acute effects: Effects vary with concentration of hydrogen sulphide and may include mild eye, nose and throat irritation at 100 ppm to sudden unconsciousness and even death at approximately 500 ppm +. Memory loss, nausea and vomiting, paralysis of facial muscles or nerve tissue damage may occur after exposures up to 500 ppm. At high concentrations, this product is a simple asphyxiant and may displace oxygen primarily when present in enclosed spaces resulting in chronic hypoxia including effects such as decreased night vision, increased respiration, decreased alertness, fatigue, tunnel vision and headache. High concentrations may also irritate eyes, skin, respiratory system, central nervous system, and peripheral nervous system



Natural Gas Sour

Chronic effects: Chronic exposure to hydrogen sulphide of 50 ppm or greater may include bronchitis and inflammation of the mucous membranes of the respiratory system. At 250 ppm hydrogen sulphide, chronic effects may include bronchial pneumonia and pulmonary edema. At high concentrations, this product is a simple asphyxiant and may displace oxygen primarily when present in enclosed spaces resulting in chronic hypoxia including effects such as decreased night vision, increased respiration, decreased alertness, fatigue, tunnel vision and headache. High concentrations may also irritate eyes, skin, respiratory system, central nervous system, and peripheral nervous system

Sensitization: Methane, ethane, propane and butane are considered cardiac sensitizers.

Mutagenicity: Not mutagenic.

Reproductive effects: Not known to cause reproductive effects, however, spontaneous abortion is possible for women exposed to pentane during pregnancy.

Carcinogenicity: Ingredients are not identified as carcinogens by IARC, NTP or ACGIH.

Target organs: CNS (central nervous system), heart.

12. Ecological Information

This product is volatile and disperses rapidly. It is not toxic to aquatic organisms and does not concentrate in the food chain. However, keep out of sewage, drainage and waterways. Report spills and releases, as applicable, under provincial and local regulations.

13. Disposal Considerations

Preferred waste management priorities are recycle, reprocess or incinerate with heat recovery.

14. Transport Information

This material normally remains in plant or is transported via pipeline and does not enter the public transportation system. i.e. rail, highway, air or water. If the material will be entering the public transportation system, for movement of samples the following information will apply.

PROPER SHIPPING NAME:	Compressed Gases, Toxic, Flammable N.O.S
PRIMARY TDG CLASS:	2.3
SECONDARY TDG CLASS:	2.1
TDG IDENTIFICATION NUMBER:	UN1953
PACKING GROUP:	Not Applicable
ERG#	115

15. Regulatory Information

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

Workplace Hazardous Materials Information Systems (WHMIS): This product has been classified in accordance with the hazard criteria of the CPR (Controlled Product Regulations), and the MSDS contains all of the information required by the CPR. This material is classified as:



Class A – Compressed Gas

Class B1 – Flammable Gas

Class D1A – Materials Causing Immediate Toxic Effects

Class D2B – Materials Causing Other Toxic Effects

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)

All components of this product are listed on the Canadian DSL Inventory.

Risk Phrases: 12-23/24-26-36/37/38-51-53-45-61

Extremely flammable. Toxic by inhalation and in contact with skin. Irritating to eyes, respiratory system and skin. Very toxic by inhalation.

Safety Phrases: 9-16-20/21-33-36/37/39-45

Keep away from sources of ignition - No smoking. When using do not eat, drink or smoke. Wear suitable protective clothing, gloves and eye/face protection. Take precautionary measures against static discharges. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

16. Other Information

Prepared for: ARC Resources Safety Department
 Preparation information: 403.503.8600
 Prepared by: Deerfoot Consulting Inc.

Disclaimer of Expressed and Implied Warranties

The information presented in the Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. However, neither ARC Resources, Deerfoot Consulting Inc nor any of their subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use.

**NATURAL GAS,
SWEET**



Material Safety Data Sheet

1. Product and Company Identification

Product Name: Natural Gas Sweet
Synonym: Natural Gas
Product use: Fuel, Petroleum Feedstock
Manufacturer: ARC Resources Ltd.
Address: Suite 2100, 440 2nd Street SW
Calgary, AB, T2P 5E9
Emergency Contact: 403-292-0434
Canutec: (613) 996-6666 or Cellular *666

2. Hazards Identification

EMERGENCY OVERVIEW

Danger!! This product is extremely flammable and will be easily ignited by heat, sparks or flames. Explosive mixtures form when vapours mix with air. Vapors may travel to a source of ignition and flash back. Vapors may cause dizziness or asphyxiation and may be irritating if inhaled at high concentrations. Fire may produce irritating and/or toxic gases.

POTENTIAL HEALTH EFFECTS/ROUTES OF EXPOSURE

Eyes: This product can be a moderate to severe irritant to the eyes. Direct contact with rapidly escaping gas may cause cryogenic (freezer) burns or frostbite. Vapors may cause irritation to the eyes, conjunctiva, and mucous membranes resulting in redness and tearing.

Skin: This product can be a slight to moderate irritant of the skin. Direct contact with rapidly escaping gas may cause cryogenic (freezer) burns or frostbite. The appearance of injury may be delayed for a few hours, but may cause tissue to become swollen, discolored and extremely painful; permanent damage or death may result without adequate medical treatment.

Ingestion: Natural gas is extremely unlikely to be swallowed and much more likely to be inhaled.

Inhalation: Vapors may cause nose and throat irritation, anesthetic effects and central nervous system (CNS) depression. Inhalation may result in dizziness, drowsiness, headaches, dizziness, mood disturbances, numbness of the extremities, sleepiness, mental confusion, poor judgment and coordination. An increased pulse rate may also occur. Hyperventilation may develop.

Warning: The burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, carbon dioxide resulting in oxygen deficiency that may result in unconsciousness, suffocation, and even death.



3. Composition/Information on Ingredients

Ingredient Name	%	CAS No.
Natural Gas	100	8006-14-2
Methane	80-97	74-82-8
Ethane	0-9	74-84-0
Propane	0-6	74-98-6
n-Butane	0-2	106-97-8
iso-Butane	0-1	75-28-5

Natural Gas is a naturally occurring gaseous hydrocarbon used as a fuel. This product is a commingled stream from multiple petroleum facilities and is a complex mixture consistent with the definition within WHMIS regulation CPR section 2. The listed components are provided as guidance based on the available knowledge of the commingled stream.

4. First Aid Measures

- Eyes:** In case of contact with eyes, immediately flush with clean, low-pressure water for at least 20 minutes. Hold eyelids open to ensure adequate flushing. Seek medical attention immediately.
- Skin:** This material can cause drying and redness of the skin. High-pressure releases may inject gas under the skin and requires immediate medical attention.
- Ingestion:** This product is naturally a gas and is unlikely to be ingested and more likely to be inhaled.
- Inhalation:** Ensure your own safety and use the appropriate respiratory protection to immediately remove the victim to an uncontaminated area. Give CPR or artificial respiration as needed and give oxygen if breathing is difficult. Keep victim at rest and get immediate medical attention.

5. Fire Fighting Measures

FLAMMABLE PROPERTIES

Flammable gas

HAZARDOUS COMBUSTION PRODUCTS:

Carbon dioxide and/or carbon monoxide will be produced upon combustion.

FIRE AND EXPLOSION HAZARDS

This product is **EXTREMELY FLAMMABLE**. DO NOT ATTEMPT TO EXTINGUISH A LEAKING GAS FIRE UNLESS THE LEAK CAN BE STOPPED. Vapors will ignite easily in the presence of any source of ignition over a wide range of concentrations and even at very low temperatures. Containers may explode when heated. Ruptured cylinders may rocket.

EXTINGUISHING MEDIA

Dry chemical, foam or CO₂ may be used according to the manufacturer's recommended technique. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers. Consider initial downwind evacuation for at least 800 meters (1/2 mile). Cool containers with large quantities of water until well after the fire has been put out. Do not direct



the water stream at the source of the leak or safety devices as icing may occur. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. Fight fires from maximum distance and for massive fires, use unmanned hose holders or monitor nozzles. If this is not possible, withdraw from the area and let the fire burn.

FIRE FIGHTING INSTRUCTIONS

Small fires in the early stages may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. When fighting fires may result in potential exposure to high heat, smoke or toxic byproducts of combustion, an approved self-contained breathing apparatus (SCBA) with full-face piece and full turnout gear must be worn. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with large quantities of water.

UNUSUAL FIRE & EXPLOSION HAZARDS:

This product is lighter than air and vapours may collect in the upper part of buildings. Burning occurs with a slightly luminous flame and very little noise. Pressurized containers of gas may explode due to heat generated by fires.

7. Handling and Storage

ACTIVATE SITE SPECIFIC EMERGENCY RESPONSE PLAN, IF AVAILABLE

Small Spills: Remove all ignition sources. Ventilate area of leak. Stop flow of gas. Do not attempt to extinguish a fire unless the leak can be stopped.

Large Spills: Isolate spill or leak area immediately for at least 50 to 100 meters (160 to 330 feet) in all directions. Keep unauthorized personnel away and stay upwind. The proper use of water spray may effectively disperse product vapours, preventing contact with ignition sources or areas/equipment that require protection. Do not discharge solid water stream pattern into the liquid resulting in splashing. Do not flush down sewer or drainage systems. Protect bodies of water by dyking, if possible.

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

Attention: Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. The application of water and/or fire fighting foam may cause spilled liquids to generate increased amounts of vapours, particularly when the water/foam temperature is warmer than the liquid. However, this effect may be desirable under certain conditions to evaporate a spill quickly. Consideration should be given to environmental clean-up and waste material generation when deciding if the use of large volumes of water is appropriate for non-fire emergency situations. Clean-up crews must be properly trained and must utilize proper protective equipment.

7. Handling and Storage

HANDLING PRECAUTIONS

Handle as a flammable gas. Keep away from all sources of heat, sparks, open flame or any sources of ignition as well as flammable materials or oxidizers. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition. Use only with adequate ventilation and avoid breathing vapours. Ground and bond all lines and equipment. Use intrinsically safe electrical equipment.

STORAGE PRECAUTIONS

Outside storage is recommended. Store in a cool, dry and well ventilated area out of sunlight and away from all sources of ignition. Avoid storage in confined locations or near incompatible materials such as other flammable materials, oxidizers or materials that support combustion. This storage area should comply with NFPA 30 (“Flammable and Combustible Liquid Code”). The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 “Cleaning Mobile Tanks In Flammable and Combustible Liquid Service” and API RP 2015 “Cleaning Petroleum Storage Tanks”.

SPECIAL PRECAUTIONS

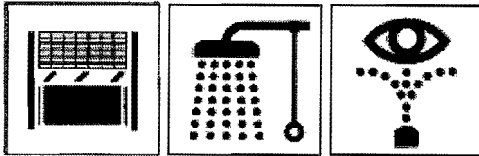
Store away from oxidizers such as oxygen, chlorine, bromine and peroxides.

WORK/HYGIENIC PRACTICES

Use good personal hygiene practices. Avoid skin exposure and wash hands before eating, drinking, smoking, or using toilet facilities. Do not eat, drink or smoke in areas of use or storage. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapours which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. Exposure Controls / Personal Protection

ENGINEERING CONTROLS



Ensure adequate ventilation to keep vapour and gas concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces. Ventilation system and other electrical equipment must be approved for flammable areas. Quick drench facilities and/or eyewash stations should be provided within the immediate work area for emergency use when there is any possibility of exposure to liquids that are extremely cold or rapidly evaporating.

PERSONAL PROTECTIVE EQUIPMENT



in emergencies



Eye/Face Protection: Wear safety glasses with side shields, chemical goggles or a full-face shield to avoid burns or tissue damage from frostbite.

Skin Protection: Avoid skin contact. Wear fire retardant clothing and insulated chemical resistant gloves in order to prevent the potential of frostbite or cryogenic burns.

Respiratory Protection: This product is a known asphyxiant and air supplied respirators are required if there is a potential for decreased oxygen concentrations. Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are unknown, or any other circumstance exist where an air-purifying respirator may not provide adequate protection. When assessing the proper type of respiratory protection, also consider the occupational exposure limits applicable to individual ingredients. Refer to CSA Standard “Selection, Use and Care of Respirators” (Z94.4-02) and NIOSH Respirator Decision Logic for additional guidance on respiratory protection.



Exposure Limits

Ingredient Name	CAS No.	Exposure Limits
Natural Gas	8006-14-2	ACGIH TLV-TWA 1,000 ppm (Alkane C1-C4)
Methane	74-82-8	ACGIH TLV-TWA 1,000 ppm (Alkane C1-C4)
Ethane	74-84-0	ACGIH TLV-TWA 1,000 ppm (Alkane C1-C4)
Propane	74-98-6	ACGIH TLV-TWA 1,000 ppm (Alkane C1-C4)
n-Butane	106-97-8	ACGIH TLV-TWA 1,000 ppm (Alkane C1-C4)
iso-Butane	75-28-5	ACGIH TLV-TWA 1,000 ppm (Alkane C1-C4)

9. Physical and Chemical Properties

Appearance and state:	Colourless gas
Odour:	Slight hydrocarbon that may not be detected by all. An odorant can be added with a foul rotten egg odour.
Odour Threshold:	500 ppm with odorant
Flash Point:	-156°C (Tagliabue CC)
Auto Ignition:	537°C (999°F)
Lower Explosive Limit (%):	5%
Upper Explosive Limit (%):	15%
Boiling Point:	-161.4°C
Melting Point:	-182.6°C
Vapour Pressure:	4500 – 4600 kPa
Vapour Density (Air = 1):	0.554
Specific Gravity:	0.71 – 0.74
Solubility (H ₂ O):	Slightly soluble
Percent Volatiles:	100%
Evaporation Rate:	Not Applicable gas
Octanol/Water Coefficient:	log Kow = 1.09

10. Stability and Reactivity

STABILITY

Stable

CONDITIONS TO AVOID (STABILITY)

Avoid high temperatures, open flames, sparks, welding, smoking and other ignitions sources.

INCOMPATIBLE MATERIALS

Avoid contact with strong oxidizers such as peroxides, chlorines, nitrates or perchlorates.

HAZARDOUS DECOMPOSITION PRODUCTS

Thermal decomposition will produce carbon dioxide and carbon monoxide.

HAZARDOUS POLYMERIZATION

Will Not Occur



11. Toxicological Information

Chemical Name	CAS No.	LD50	LC50
Natural Gas	8006-14-2	Not applicable	Not available
Methane	74-82-8	Not applicable	Not available
Ethane	74-84-0	Not applicable	Not available
Propane	74-98-6	Not applicable	Not available
n-Butane	106-97-8	Not applicable	658mg/l rat
iso-Butane	75-28-5	Not applicable	Not available

POTENTIAL HEALTH EFFECTS

Acute effects: At very high concentrations, this product is a simple asphyxiant and may displace air resulting in suffocation, CNS depression, dizziness, confusion, asphyxia, drowsiness, narcosis, headache, muscle weakness, numb extremities and even unconsciousness or chemical pneumonia (aspiration of liquid). If rapidly escaping gas comes in contact with skin this product may result in frostbite and dermatitis.

Chronic effects: In prolonged periods of high concentrations, this product is a simple asphyxiant and may displace oxygen primarily resulting in chronic hypoxia including effects such as decreased night vision, increased respiration, decreased alertness, fatigue, tunnel vision and headache.

Sensitization: Methane, ethane, propane and butane are considered cardiac sensitizers.

Mutagenicity: Not mutagenic.

Reproductive effects: Not known to cause reproductive effects.

Carcinogenicity: Ingredients are not identified as carcinogens by IARC, NTP or ACGIH.

Target organs: CNS (central nervous system), heart.

12. Ecological Information

This product is volatile and disperses rapidly. It is not toxic to aquatic organisms and does not concentrate in the food chain. However, keep out of sewage, drainage and waterways. Report spills and releases, as applicable, under provincial and local regulations.

13. Disposal Considerations

Vent to a safe location and ensure dissipation of gas is below the LEL or incinerate through a flaring system. Preferred waste management priorities are reprocess or incinerate with heat recovery.

14. Transport Information

This material is transported via pipeline and does not enter the public transportation system. i.e. rail, highway, air or water. If the material will be entering the public transportation system, for movement of samples the following information will apply.

PROPER SHIPPING NAME: Natural Gas, compressed
PRIMARY TDG CLASS: 2.1
SECONDARY TDG CLASS: Not Applicable
TDG IDENTIFICATION NUMBER: UN1971
PACKING GROUP: Not Applicable
ERG #: 115

15. Regulatory Information

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

Workplace Hazardous Materials Information Systems (WHMIS): This product has been classified in accordance with the hazard criteria of the CPR (Controlled Product Regulations), and the MSDS contains all of the information required by the CPR. This material is classified as:



Class A – Compressed Gas

Class B1 – Flammable Gas

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)

All components of this product are listed on the Canadian DSL Inventory.

Risk Phrases: 12

Extremely flammable.

Safety Phrases: 9-16-20/21-33-36/37/39-45

Keep away from sources of ignition - No smoking. When using do not eat, drink or smoke. Wear suitable protective clothing, gloves and eye/face protection. Take precautionary measures against static discharges. In case of accident or if you feel unwell, seek medical advice immediately.

16. Other Information

Prepared for:	ARC Resources Safety Department
Preparation information:	403.503.8600
Prepared by:	Deerfoot Consulting Inc.

Disclaimer of Expressed and Implied Warranties

The information presented in the Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. However, neither Arc Resources, Deerfoot Consulting Inc nor any of their subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use.

NOX-RUST

501 LS

MATERIAL SAFETY DATA SHEET

DAUBERT CHEMICAL COMPANY

4700 SOUTH CENTRAL AVENUE
CHICAGO, ILLINOIS 60638
TELEPHONE: (708) 496-7350
FAX: (708) 496-7367

EMERGENCY CONTACT:
CHEMTREC (800) 424-9300

HMIS HAZARD RATING

HEALTH	2
FIRE	2
REACTIVITY	0
PERSONAL PROTECTION	D

Date of Review: January 2, 2013
Date of Preparation: June 30, 2004

Revised: January 8, 2010
By: R. Lauterbach

SECTION 1: PRODUCT IDENTIFICATION

Product Name: **NOX-RUST® 501 LS**
Chemical Family: Petroleum Solvent/Asphalt Blend
Material Usage: Corrosion Preventive Compound (MIL-PRF-16173E, Class 1, Grade 1)

EMERGENCY OVERVIEW: Petroleum solvent-based product with solvent odor. Combustible liquid; when product burns it releases typical hydrocarbon products of combustion. Refer to Section 3 for health effects and to Section 5 for fire hazard data.

SECTION 2: HAZARDOUS INGREDIENTS

Component	Wt%	Recommended Exposure Limits (TWA)
^[1] Petroleum Asphalt CAS #8052-42-4	40-45	ACGIH TLV: 5 mg/m ³ (for fumes) NIOSH: 5 mg/m ³ (ceiling limit)
Aliphatic Petroleum Solvent CAS #64742-88-7 and/or #64742-47-8 and/or #8052-41-3	48-53	OSHA PEL: 100 ppm ACGIH TLV: 100 ppm ACGIH STEL: 200 ppm
Hydrogen Sulfide 7783-06-4	<0.08	OSHA PEL: 20 ppm ACGIH TLV: 10 ppm ACGIH STEL: 15 ppm
Aromatic Petroleum Distillates CAS #64742-95-6	1-5	None Established

^[1]See Section 3.

SECTION 3: HEALTH HAZARD INFORMATION

Primary Routes of Entry: Inhalation, skin absorption.

Acute Effects: Inhalation of vapors may cause nose, throat, and mucous membrane irritation, and nausea, headaches or dizziness, and central nervous system depression, including drowsiness, loss of coordination, and unconsciousness.

Prolonged or repeated skin contact with cold product may result in dryness and irritation of the skin. Prolonged contact with clothing saturated in petroleum distillates can cause second degree burns. Long term skin exposure to asphalt can increase sensitivity to the sun and cause discoloration. Eye contact may cause severe irritation, redness, tearing and blurred vision. If ingested, may cause mouth, throat and gastrointestinal tract irritation and upset with possible nausea, vomiting and diarrhea. Aspiration of petroleum distillates into the lungs can cause severe chemical pneumonitis which can be fatal.

Chronic Effects: Prolonged or repeated skin contact with these products may result in irritation and dermatitis. Studies of workers exposed to asphalt have not established an association between asphalt and cancer or other lung disease in man. However this petroleum based product contains a variable amount of polycyclic aromatic hydrocarbons which have been shown to cause cancer and respiratory damage in laboratory animals.

Carcinogenicity: Petroleum Asphalt: In March 1987, the International Agency for Research on Cancer (IARC) classified extracts of steam and air refined bitumen's (such as mineral spirits cutback asphalt) as possibly carcinogenic to humans (Group 2B). This classification was based on combined evaluation of published human and animal studies. IARC concluded that the human studies did not provide adequate evidence that extracts of steam and air refined bitumen's caused cancer in humans. No epidemiological study of workers exposed only to bitumen's is available. The 2B classification was substantially based on experimental animal studies. Some bitumen's (asphalt) diluted, dissolved or liquified in solvents (e.g. cutback asphalt) have produced skin cancer in laboratory animals at the site of application. NIOSH recently conducted mouse skin painting studies using selected fractions of asphalt fume condensate. Skin application of the condensate fractions resulted in skin tumors in laboratory mice. Based on skin painting data, IARC has concluded that there is sufficient evidence of carcinogenicity of those extracts. IARC regards it prudent to treat a material for which there is sufficient evidence of carcinogenicity in animals as if it is possibly carcinogenic in humans. Intermittent or occasional skin contact with petroleum asphalt's is not expected to have serious health effects as long as good personal hygiene measures, such as those outlined in the Material Safety Data Sheet, are followed.

Pre-Existing Medical Conditions Aggravated by Exposure: Chronic respiratory or skin conditions may worsen from exposure to these products.

SECTION 4: FIRST AID PROCEDURES

Inhalation: Move victim to fresh air and call emergency medical care. If not breathing, give artificial respiration; if breathing is difficult, give oxygen.

Eyes: In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Seek immediate medical attention.

Skin: Wash skin with soap and water. Remove and isolate contaminated clothing and shoes at the site.

Ingestion: DO NOT INDUCE VOMITING. Consult a physician. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs.

SECTION 5: FIRE AND EXPLOSION HAZARD DATA

Flash Point: 105°F min.

Explosive Limits: LEL = 0.6 UEL = 7.0

Extinguishing Media: Small Fires: Dry chemical, CO₂, water spray, or regular foam. Large Fires: Water spray, fog, or regular foam. Move container from fire area if you can do it without risk. Apply cooling water to sides of containers that are exposed to flames until well after fire is out. Stay away from ends of tanks. For massive fire in cargo area, use unmanned hose holder or monitor nozzles. If this is impossible, withdraw from area and let fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.

Special Firefighting Protection/Emergency Action: Fire may produce irritating or poisonous gases. Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide limited protection. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind; keep out of low areas. Isolate for 1/2 mile in all directions if tank, rail car or tank truck is involved in fire. If runoff from fire control occurs, notify the appropriate authorities.

Unusual Fire/Explosion Hazards: Flammable/combustible material; may be ignited by heat, sparks or flames. Vapors may travel to a source of ignition and flash back. Container may explode in heat of fire. Vapor explosion hazard indoors, outdoors or in sewers. Runoff to sewer may create fire or explosion hazard.

Products of Combustion: Carbon monoxide, carbon dioxide, miscellaneous hydrocarbons.

SECTION 6: SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Steps to be Taken in case Material is Released or Spilled: Shut off ignition sources; no flares, smoking or flames in hazard area. Stop leak if you can do it without risk.

Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal.

Large Spills: Dike far ahead of liquid spill for later disposal.

SECTION 7: SAFE HANDLING INFORMATION

Precautions To Be Taken In Handling/Storage: Store in cool, well-ventilated area. Keep away from flames, sparks or hot surfaces. Never use a torch to cut or weld on or near container. Empty containers can contain explosive vapors.

Heated asphalt may emit hydrogen sulfide, an extremely flammable, colorless, highly toxic gas, which may accumulate in storage tanks and bulk transport compartments. Prolonged breathing (greater than 1 hour) of concentrations of hydrogen sulfide around 50 ppm can produce eye and respiratory tract (mouth, nose and throat) irritation, and at high concentrations (around 300 ppm) is considered immediately dangerous to life and health.

Other Precautions: Never wear contaminated clothing. Launder or dry clean before wearing. Discard oil-soaked shoes. Wash

thoroughly with soap and water (waterless hand cleaner may be helpful in removing residues) after use and before smoking or eating. Avoid excessive skin contact.

SECTION 8: EXPOSURE CONTROLS

Respiratory Protection: NIOSH-approved respirator for organic vapor and mist to control exposure where ventilation is inadequate. In situations where Hydrogen Sulfide may exceed; the PEL or TLV, supplied air respirators or self-contained breathing apparatus are required.

Ventilation: General and local exhaust.

Personal Protective Equipment: Protective Gloves: Impervious gloves (Viton, PVOH, etc.) Eye Protection: Safety glasses with sideshields or chemical goggles. Other Protective Clothing or Equipment: If splashing is anticipated, wear rubber apron and boots or other protective equipment to minimize contact.

Work/Hygienic Practices: Handle in accordance with good industrial hygiene and safety practices. These include avoiding any unnecessary exposure and removal of the material from the skin, eyes and clothing. Wash hands and arms frequently. Shower after exposure. Wash work clothes when soiled. Safety showers and eye wash stations should be available. Product is combustible. Avoid smoking, keep away from open flames and sources of static or electrical sparking. Use explosion proof motors and equipment. Tank trucks and other containers should be grounded and/or bonded when material is transferred.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Color: Black	Appearance: Viscous Liquid
Odor: Petroleum Solvent	Boiling Point (initial): Not Determined
Evaporation Rate (n-Butyl Acetate=1): <1	Vapor Pressure (mmHg @ 20°C): Not Determined
Vapor Density (air=1): >1	Solubility in Water: Negligible
Specific Gravity: 0.89	pH: Not Applicable
Percent Volatile by Volume: 57	

SECTION 10: REACTIVITY HAZARD DATA

Stability: Stable

Incompatibility: Strong acids, oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, miscellaneous hydrocarbons.

Hazardous Polymerization: Will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

None known.

SECTION 12: ECOLOGICAL INFORMATION

None known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Methods: Dispose of in accordance with state, local and federal regulations. Materials may become a hazardous waste through use. If permitted, incineration may be practiced. Consider recycling solvent.

SECTION 14: TRANSPORTATION INFORMATION

***** EXPORT AND AIR TRANSPORTATION *****

Totes and Tankers

UN1268, PETROLEUM DISTILLATES N.O.S., (Naphtha Solvent), 3, PGIII

Domestic by Ground (Pails, Kegs, Drums): Non-Regulated

SECTION 15: REGULATORY INFORMATION

Volatile Organic Content: (Calculated Values)

VOC per gallon: 3.7 lbs/gal
VOC per gallon minus exempt solvents and water: 3.7 lbs/gal

EPA Hazardous Waste Number(s) (40CFR Part 261): D001

EPA Hazard Category (40CFR Part 370): IMMEDIATE (ACUTE)
DELAYED (CHRONIC)
FIRE HAZARD (COMBUSTIBLE)

TSCA

All components of this product are listed on the TSCA Inventory and/or are otherwise in compliance with TSCA.

SARA TITLE III

This product contains the following TOXIC CHEMICALS subject to the *Reporting Requirements of Sec. 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986, and of 40CFR Part 372:*

CHEMICAL	CAS NO.	WT %
1,2,4-Trimethyl Benzene	95-63-6	0.5-2.5
Cumene	98-82-8	0.05-0.10
Xylene	1330-20-7	0.05-0.11

This product contains the following EXTREMELY HAZARDOUS SUBSTANCE(S) subject to the *Emergency Planning Requirements under Sec. 301-303 (40CFR Parts 300 and 355) and Emergency Release Notification Requirements under Sec. 304:*

CHEMICAL	CAS NO.	WT %	RQ/TPQ Lbs
Hydrogen Sulfide	7783-06-4	<0.08	100

(CERCLA LIST) This product contains the following HAZARDOUS SUBSTANCE(S) subject to *Emergency Release Notification Requirements under Sec. 304 (40 CFR Part 302):*

CHEMICAL	CAS NO.	WT %	Final RQ Lbs
Cumene	98-82-8	0.05-0.10	5000
Xylene	1330-20-7	0.05-0.11	100

CALIFORNIA PROPOSITION 65

In addition to the following chemical, this product contains trace quantities of chemicals that are identified by the State of California under the *Safe Drinking Water and Toxic Reinforcement Act of 1986* ("Proposition 65") as either a carcinogenic or reproductive hazard:

CHEMICAL	CAS NO.	Estimated Concentration %
Petroleum Asphalt	8052-42-4	40-45

WHMIS CLASSIFICATION: B3, D2B

SECTION XVI: OTHER INFORMATION

Although the information contained herein is believed to be reliable, it is furnished without warranty of any kind. This information is not intended to be all-inclusive as to the manner and conditions of use, handling, and storage.

OFF

Material Safety Data Sheet

according to ANSI Z400.1- 2004 and 29 CFR 1910.1226



OFF!® DEEP WOODS® SPRAY INSECT REPELLENT 5 (REG. NO. 29931 P.C.P. ACT)

Version 1.0

Print Date 05/31/2011

Revision Date 01/10/2011

MSDS Number 350000012887
SITE_FORM Number
300000000000000003296.003

1. PRODUCT AND COMPANY IDENTIFICATION

Product information

Trade name : OFF!® DEEP WOODS® SPRAY INSECT REPELLENT 5 (REG. NO. 29931 P.C.P. ACT)

Use of the Substance/Mixture : Insect Repellent

Company : S.C. Johnson and Son, Limited
1 Webster Street
Brantford ON N3T 5R1

Emergency telephone number : 24 Hour Transport & Medical Emergency Phone (866) 231-5406
24 Hour International Emergency Phone (952) 852-4647
24 Hour Canadian Transport Emergency Phone (CANUTEC) (613) 996-6666

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance / Odor : clear / liquid / pleasant

Immediate Concerns

: Warning
FLAMMABLE:
CAUSES EYE IRRITATION.
Keep away from heat, sparks and flame.
Harmful if swallowed.
Avoid contact with eyes and lips.

Potential Health Effects

Exposure routes : Eye, Skin, Inhalation, Ingestion.

Eyes : Causes:
Moderate eye irritation

Skin : May cause skin reactions in rare cases.
Prolonged or repeated contact may dry skin and cause irritation.

Inhalation : May cause nose, throat, and lung irritation.
Inhalation may cause central nervous system effects.

Ingestion : May cause irritation to mouth, throat and stomach.
May cause abdominal discomfort.

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Causes headache, drowsiness or other effects to the central nervous system.
Harmful if swallowed.

Aggravated Medical Condition : Do not apply to cuts or irritated skin.
Persons with pre-existing skin disorders may be more susceptible to irritating effects.
Individuals with chronic respiratory disorders such as asthma, chronic bronchitis, emphysema, etc. may be more susceptible to irritating effects.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous chemicals present at or above reportable levels as defined by OSHA 29 CFR 1910.1200 or the Canadian Controlled Products Regulations are listed in this table:

Chemical Name	CAS-No.	Weight percent
Ethyl alcohol	64-17-5	30.00 - 60.00
N,N-Diethyl-m-toluamide	134-62-3	10.00 - 30.00

For additional information on product ingredients, see www.whatsinsidescjohnson.com.

4. FIRST AID MEASURES

Eye contact : Remove contact lenses. Flush immediately with plenty of water for at least 15 to 20 minutes. Get medical attention if irritation develops and persists.

Skin contact : Wash off immediately with plenty of water. Rinse with plenty of water. Get medical attention if irritation develops and persists. If you suspect a reaction to this product, discontinue use and remove contaminated clothing.

Inhalation : Remove to fresh air.

Ingestion : If swallowed, 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.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

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- Specific hazards during fire fighting : Flammable liquid. Vapors are heavier than air and may travel to a source of ignition and flash back. Liquid run-off to sewers may create fire/explosion hazard. Container may melt and leak in heat of fire. Do not allow run-off from fire fighting to enter drains or water courses. Burns with colourless flame.
- Further information : Fight fire from maximum distance or protected area. Cool and use caution when approaching or handling fire-exposed containers. For large quantities of flammable liquids, consider containment to prevent the spread of fire. Wear full protective clothing and positive pressure self-contained breathing apparatus. In case of fire and/or explosion do not breathe fumes.
- Flash point : 29 °C
84.2 °F
Method: Tag Closed Cup (TCC)
- Lower explosion limit : Note: no data available
- Upper explosion limit : Note: no data available

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions : Remove all sources of ignition.
Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
Wear personal protective equipment.
- Environmental precautions : Do not flush into surface water or sanitary sewer system.
Use appropriate containment to avoid environmental contamination.
Outside of normal use, avoid release to the environment.
- Methods for cleaning up : Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).
Use only non-sparking equipment.
Dike large spills.
Clean residue from spill site.

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7. HANDLING AND STORAGE

Handling

Advice on safe handling : Avoid contact with eyes and lips.
Avoid breathing vapors, mist or gas.
For personal protection see section 8.
Use only as directed.
KEEP OUT OF REACH OF CHILDREN AND PETS.
Smoking, eating and drinking should be prohibited in the application area.

Advice on protection against fire and explosion : Keep away from heat and sources of ignition.
Take measures to prevent the build up of electrostatic charge.

Storage

Requirements for storage areas and containers : Keep away from food, drink and animal feedingstuffs.
Keep container closed when not in use.
Keep in a dry, cool and well-ventilated place.

Other data : Stable under normal conditions.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Components	CAS-No.	mg/m3	ppm	Non-standard units	Basis
Ethyl alcohol	64-17-5	-	1,000 ppm	-	ACGIH STEL

Personal protective equipment

Respiratory protection

Industrial setting : Use only with adequate ventilation.
Do not spray in enclosed areas.

Household setting : Use only with adequate ventilation.

Hand protection : No special requirements.

Eye protection

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Industrial setting : Safety glasses with side-shields

Household setting : Avoid contact with eyes.

Skin and body protection : No special requirements.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Wash thoroughly after handling. Smoking, eating and drinking should be prohibited in the application area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form : liquid

Color : clear

Odor : pleasant

pH : 5.3

Boiling point : no data available

Freezing point : no data available

Flash point : 29 °C
84.2 °F
Method: Tag Closed Cup (TCC)

Evaporation rate : no data available

Flammability (solid, gas) : no data available

Lower explosion limit : no data available

Upper explosion limit : no data available

Vapour pressure : no data available

Density : 0.93 g/cm³

Water solubility : soluble

Partition coefficient: n-octanol/water : no data available

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Viscosity, dynamic : no data available

Viscosity, kinematic : not applicable

Volatile Organic Compounds (California Air Resource Board – CARB) : 34.9 % - does not include any applicable regulatory exemptions

Total VOC (wt. %) :

10. STABILITY AND REACTIVITY

Conditions to avoid : Heat, flames and sparks.

Materials to avoid : Strong oxidizing agents

Hazardous decomposition products : Thermal decomposition can lead to release of irritating gases and vapours.

Hazardous reactions : Stable under recommended storage conditions.

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity : LD50
4,103 mg/kg

Acute inhalation toxicity : LC50
> 2.07 mg/l

Acute dermal toxicity : LD50
> 5,000 mg/kg

Chronic effects

Carcinogenicity : no data available

Mutagenicity : no data available

Reproductive effects : no data available

Teratogenicity : no data available

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Sensitisation : Not known to be a sensitizer.

12. ECOLOGICAL INFORMATION

Ecotoxicity effects : no data available

13. DISPOSAL CONSIDERATIONS

PESTICIDAL WASTE:
Observe all applicable Federal, Provincial and State regulations and Local/Municipal ordinances regarding disposal.
Consumer may discard empty container in trash, or recycle where facilities exist.

RCRA waste class : D001 (Ignitable Waste)

14. TRANSPORT INFORMATION

Land transport

▪ **U.S. DOT and Canadian TDG Surface Transportation:**

Proper shipping name UN 1993 FLAMMABLE LIQUID N.O.S. (ethanol), 3, III
Class: 3
UN number 1993
Packaging group: III
Note: SC Johnson ships this product as Consumer Commodity ORM-D (non-bulk packages)

Sea transport

▪ **IMDG:**

Proper shipping name UN 1993 FLAMMABLE LIQUID N.O.S. (ethanol), 3, III
Class: 3
UN number: 1993
Packaging group: III
EmS: F-E, S-E
Note: Limited quantities derogation may be applicable to this product, please check transport documents.

Air transport

Material Safety Data Sheet

according to ANSI Z400.1- 2004 and 29 CFR 1910.1226



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MSDS Number 350000012887

SITE_FORM Number

30000000000000003296.003

▪ **ICAO/IATA:**

Proper shipping name: UN 1993 FLAMMABLE LIQUID N.O.S. (ethanol), 3, III
Class: 3
UN/ID No.: UN 1993
Packaging group: III
Note: SC Johnson typically does not ship products via air, therefore it has not been determined if the product container meets current IATA/ICAO package criteria. Refer to IATA/ICAO Dangerous Goods Regulations for detailed instructions when shipping this item by air.

15. REGULATORY INFORMATION

- Notification status : All ingredients of this product are listed or are excluded from listing on the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.
- Notification status : All ingredients of this product comply with the New Substances Notification requirements under the Canadian Environmental Protection Act (CEPA).
- California Prop. 65 : This product is not subject to the reporting requirements under California's Proposition 65.
- Canada Regulations : This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

16. OTHER INFORMATION

HMIS Ratings

Health	2
Flammability	3
Reactivity	0

NFPA Ratings

Health	2
Fire	3
Reactivity	0
Special	

Further information

Material Safety Data Sheet

according to ANSI Z400.1- 2004 and 29 CFR 1910.1226



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Prepared by:	SC Johnson Global Safety Assessment & Regulatory Affairs (GSARA)
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PGS-68,
PGS-100, PGS-
150, PGS-220,
PGS-460

MATERIAL SAFETY

SUMMIT INDUSTRIAL PRODUCTS, INC.

DATA SHEET

9010 CR 2120, Tyler, TX 75707

(903) 534-8021

DATE: 03/21/05

REVISED: 03/21/05

SUPERSEDES: 02/07/02

I. PRODUCT IDENTIFICATION

Trade Name:	PGS-68, PGS-100, PGS-150, PGS-220, PGS-460
Chief Constituent:	Polyoxyalkylene Glycol
Hazardous Ingredients/OSHA:	None
Ingredients/OSHA/NTP/IARC:	None
Ingredients Regulated by SARA Title 3, Section 313:	None

II. WARNING STATEMENTS

None

III. PHYSICAL AND CHEMICAL DATA

Appearance and Odor:	Bright & clear, Mild glycol odor
Specific Gravity:	>1.0
Boiling Point:	Not determined
Vapor Pressure:	Not determined

IV. FIRE PROTECTION

Flash Point:	>460°F
Extinguishing Media:	Water, dry chemical, foam or CO ₂
Special Firefighting Procedure:	Wear self-contained breathing apparatus
Unusual Fire Hazard:	Closed containers will build up pressure when exposed to heat

V. REACTIVITY DATA

Thermal Stability:	Stable up to 560°F
Materials to Avoid:	Strong oxidizers
Hazardous Polymerization:	Will not occur
Hazardous Decomposition Products:	Carbon dioxide, carbon monoxide

VI. HEALTH HAZARD DATA

Exposure Limits:	None established
Effects of Overexposure:	Lethargy and G.I. discomfort from oral ingestion.

VII. PHYSIOLOGICAL EFFECTS SUMMARY

ACUTE:	
Eyes:	Not an irritant
Skin:	Not an irritant
Respiratory System:	Not an irritant
CHRONIC:	None known
OTHER:	None

VIII. PRECAUTIONS FOR SAFE HANDLING

For general personal hygiene, wash hands thoroughly after handling material. Avoid contact with skin and eyes.

IX. PROTECTION AND CONTROL MEASURES

Protective Equipment: Eye goggles
Respiratory Protection: None required
Ventilation: Local mechanical exhaust

X. EMERGENCY AND FIRST AID PROCEDURES

Eye Contact: Flush with water for 15 minutes. If irritation develops, call a physician.
Skin Contact: Wash with soap and water.
Inhalation: Remove to fresh air..
Ingestion: First Aid not normally required. If uncomfortable, call physician.

XI. NOTES

	HAZARD RATING INFORMATION			KEY	
	NPCA/HMIS	NFPA			
Health	1	1	4 = Severe	1 = Slight	
Flammability	1	1	3 = Serious	0 = Minimal	
Reactivity	0	0	2 = Moderate		

XII. SPILL AND DISPOSAL PROCEDURES

Environmental Impact: Report spills as required to appropriate authorities. U. S. Coast Guard regulations require immediate reporting of spills that could reach any waterway including intermittent dry creeks. Report spill to Coast Guard Toll Free Number (800) 424-8802. In case of accident or road spill, notify Chemtrec (800) 424-9300.

Procedures if Material is Released or Spilled: Absorb on fire retardant treated sawdust, diatomaceous earth, etc. Shovel up and dispose of at an appropriate waste disposal facility in accordance with current applicable laws and regulations, and product characteristics at time of disposal.

Waste Management: Dispose of according to Federal, State and Local regulations.

Toxic Substance Inventory Control Act: All components are included on the TSCA Inventory and are in compliance with the TSCA.

FOR ADDITIONAL INFORMATION CONTACT:

SUMMIT INDUSTRIAL PRODUCTS, INC.
P. O. Box 131359
Tyler, Texas 75713
(903) 534-8021

INFORMATION GIVEN HEREIN IS OFFERED IN GOOD FAITH AS ACCURATE, BUT WITHOUT GUARANTEE. CONDITIONS OF USE AND SUITABILITY OF THE PRODUCT FOR PARTICULAR USES ARE BEYOND OUR CONTROL; ALL RISKS OF USE OF THE PRODUCT ARE THEREFORE ASSUMED BY THE USER AND WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. NOTHING IS INTENDED AS A RECOMMENDATION FOR USES WHICH INFRINGE VALID PATENTS OR AS EXTENDING LICENSE UNDER VALID PATENTS. APPROPRIATE WARNINGS AND SAFE HANDLING PROCEDURES SHOULD BE PROVIDED TO HANDLERS AND USERS

PRODUCED WATER, SOUR



Material Safety Data Sheet

1. Product and Company Identification

Product Name: Produced Water, Sour
Synonym: Produced Water
Product use: Produced water is a by-product of petroleum production
Manufacturer: ARC Resources Ltd.
Address: Suite 2100, 440 2nd Street SW
Calgary, AB, T2P 5E9
Emergency Contact: 403-292-0434
Canutec: (613) 996-6666 or Cellular *666

2. Hazards Identification

EMERGENCY OVERVIEW

This product contains hydrogen sulphide, which is an extremely toxic and flammable gas at low concentrations. Exposures to hydrogen sulphide above 100 ppm are immediately dangerous to life and health (IDLH) and may be fatal. Exposures to hydrogen sulphide above 10 ppm to 100 ppm may produce irritation to eyes, nose, throat and respiratory system. This product is flammable based on impurities. Vapours are heavier than air and may travel considerable distances to a source of ignition and flash back. Vapours may spread along the ground and may enter sewers, basements and other confined spaces.

POTENTIAL HEALTH EFFECTS/ROUTES OF EXPOSURE

Eyes: This product is a moderate eye irritant and chronic exposure may cause hemorrhage of the eye.

Skin: This product is a moderate irritant of the skin and repeated or prolonged contact can defat the skin and lead to dermatitis and possibly skin cancer.

Inhalation: Inhalation may cause headaches, loss of appetite, drowsiness, nausea and vomiting, loss of consciousness and even death. It may also affect the central nervous system, liver and kidneys based on possible contaminants.

Ingestion: If this product is ingested, vomiting and diarrhea may occur. Aspiration of the liquid into the lungs may produce chemical pneumonia, severe lung damage and/or respiratory failure.

3. Composition/Information on Ingredients

Ingredient Name	%	CAS No.	Exposure Limits
Dissolved minerals salts and water	100	Not applicable	Not applicable
Crude oil and hydrocarbons	Trace	8005-02-9	Not applicable
Hydrogen Sulphide	0.5-5	7783-06-4	ACGIH TLV-TWA =10 ppm ACGIH TLV-TWA =15 ppm



Produced water is a byproduct associated with Natural Gas processing and is injected into the formation. Sour produced water contains dissolved hydrogen sulphide.

4. First Aid Measures

- Eyes:** Immediately flush eyes while holding eyelid open, with lukewarm water for a least 20 minutes. Seek medical attention if irritation persists.
- Skin:** Remove contaminated clothing and launder before wearing. Wash exposed skin with soap and water (waterless hand cleaner may be used if clean water is not readily available). Seek medical attention if irritation persists.
- Inhalation:** Ensure your own safety and use the appropriate respiratory protection to immediately remove the victim to an area free of contaminants. Give CPR or artificial respiration as needed and give oxygen if breathing is difficult. Keep victim at rest and get immediate medical attention.
- Ingestion:** Do not induce vomiting because of the danger of aspiration of liquids into the lungs. Obtain immediate medical attention.

5. Fire Fighting Measures

FLAMMABLE PROPERTIES

The water mixture itself is not flammable but flammable impurities are possible.

HAZARDOUS COMBUSTION PRODUCTS

Contaminants may burn with very smoky flame. Carbon monoxide, carbon dioxide, sulfur dioxide and irritating products of incomplete combustion may be generated.

FIRE AND EXPLOSION HAZARDS

Product is extremely toxic due to the hydrogen sulphide content. Product contaminant vapours are heavier than air and may travel considerable distances to a source of ignition and flash back. Vapours may spread along the ground and enter sewers, basements and other confined spaces.

EXTINGUISHING MEDIA

Small Fires: Use dry chemicals, CO₂, or alcohol resistant foam.

Large Fires: Use water spray, fog or alcohol resistant foams (with manufacturer's recommended application techniques).

FIRE FIGHTING INSTRUCTIONS

Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers. Consider initial downwind evacuation for at least 800 meters (1/2 mile). Cool containers with large quantities of water until well after the fire has been put out. Do not direct the water stream at the source of the leak or safety devices as icing may occur. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. Fight fires from maximum distance and for massive fires, use unmanned hose holders or monitor nozzles. If this is not possible, withdraw from the area and let the fire burn.

If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

UNUSUAL FIRE & EXPLOSION HAZARDS:



Product contaminant vapours are heavier than air. Vapours may travel considerable distances to a source of ignition and flash back. Vapours may spread along the ground and enter sewers, basements and other confined space.

6. Accidental Release Measures

ACTIVATE SITE SPECIFIC EMERGENCY RESPONSE PLAN, IF AVAILABLE.

Isolate and ventilate area. Consider evacuation and wear positive pressure self-contained breathing apparatus. Remove or shut off all sources of ignition. Avoid skin contact. Use vapour suppressing foam or water spray to reduce vapours. Do not allow liquid to enter sewers, streams or other bodies of water. Place absorbent materials into closed containers or burn in approved combustion chambers.

Small Spills: Use clay or earth to absorb small spills.

Large Spills: Recover liquid and remove contaminated earth.

7. Handling and Storage

HANDLING PRECAUTIONS

Handle as a flammable liquid. Ensure adequate ventilation and keep away from heat, sparks, open flame and other sources of ignition. Ground all drums and transfer vessels when handling. Empty product containers or vessels may contain explosive vapours. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition. Avoid breathing vapours. Wash thoroughly after handling. Electrical equipment must be intrinsically safe. **DO NOT** siphon by mouth.

STORAGE PRECAUTIONS

Store in a well ventilated area. This storage area should comply with NFPA 30. Avoid storage near incompatible materials such as flammable or combustible materials, oxidizers or materials that support combustion.

WORK/HYGIENIC PRACTICES

An emergency eye wash station should be available in the vicinity of any potential splash exposure. Use good personal hygiene practices. Avoid skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities and do not eat, drink or smoke in areas of use or storage. Waterless hand cleansers may be used if water is not readily available. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapours which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

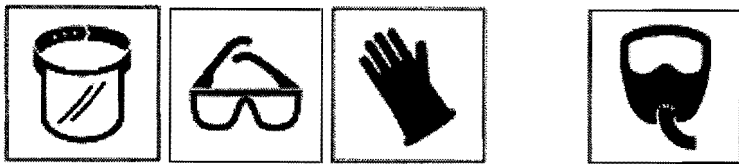
SPECIAL PRECAUTIONS

Avoid contact with mineral acids that can liberate hydrogen sulphide. Showers and eyewash stations should be provided within the immediate work area for emergency use when there is an elevated risk of splashing of liquids. Work areas should be assessed for airborne hydrogen sulphide.

8. Exposure Controls / Personal Protection

ENGINEERING CONTROLS

Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Ensure adequate ventilation to keep vapor and gas concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces. Ventilation system and other equipment must be intrinsically safe. Showers and/or eyewash fountains should be provided within the immediate work area for emergency use when there is any possibility of exposure to liquids.



PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: Wear chemical goggles or a full face shield when handling this product.

Skin Protection: Avoid skin contact. Wear fire retardant clothing and chemical resistant gloves when handling this product.

Respiratory Protection: Contaminants contained in this product may be known as asphyxiants and air supplied respirators are required if there is a potential for decreased oxygen concentrations. Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece must be worn if the concentration exceeds the OEL (Occupational Exposure Limit) of hydrogen sulphide or LELs. When assessing the proper type of respiratory protection, also consider the occupational exposure limits applicable to individual ingredients. Refer to CSA Standard "Selection, Use and Care of Respirators" (Z94.4-02) and NIOSH Respirator Decision Logic for additional guidance on respiratory protection.

Exposure Limits

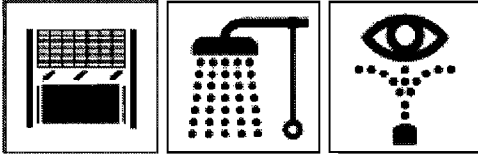
Ingredient Name	CAS No.	Exposure Limits
Dissolved minerals salts and water	Not applicable	Not applicable
Crude oil and hydrocarbons	8005-02-9	Not applicable
Hydrogen Sulphide	7783-06-4	ACGIH TLV-TWA = 10 ppm ACGIH TLV-TWA = 15 ppm

9. Physical and Chemical Properties

Appearance and state:	Clear liquid with slight amber colour
Odour:	Hydrocarbon odour with the potential for rotten egg odour
Odour Threshold:	Not available
Flash Point:	The water mixture itself is not flammable but flammable impurities are possible.
Auto Ignition:	Not applicable
Lower Explosive Limit (%):	Not applicable
Upper Explosive Limit (%):	Not applicable
Boiling Point:	Variable with source



Produced Water, Sour



MONITORING CONTROLS



Melting Point:	Variable with source
Vapour Pressure:	Similar to water
Vapour Density (Air = 1):	Not available
Viscosity:	Not available
Specific Gravity:	Not available
Solubility (H ₂ O):	Very soluble
Percent Volatiles:	Not applicable
Evaporation Rate:	Not applicable

10. Stability and Reactivity

STABILITY

Stable

CONDITIONS TO AVOID (STABILITY)

Material is stable under normal conditions. Avoid high temperatures, open flames, sparks, welding, smoking and other ignitions sources.

INCOMPATIBLE MATERIALS

Keep away from strong oxidizers such as peroxides, chlorine, nitrates, perchlorates and mineral acids, ignition sources and heat.

HAZARDOUS DECOMPOSITION PRODUCTS:

Irritating or toxic substances may be emitted upon thermal decomposition. Decomposition products include carbon monoxide, carbon dioxide and sulphur dioxide.

HAZARDOUS POLYMERIZATION

Will Not Occur.

11. Toxicological Information

Chemical Name	CAS No.	LD50	LC50
Dissolved minerals salts and water	Not applicable	Not applicable	Not applicable
Crude oil and hydrocarbons	8005-02-9	Not applicable	Not applicable
Hydrogen Sulphide	7783-06-4	Not applicable	Rat inhalation 380 mg/ cu m > 960 min

POTENTIAL HEALTH EFFECTS

Acute: Effects vary with concentration of hydrogen sulphide and may include mild eye, nose and throat irritation at 100 ppm to sudden unconsciousness and even death at approximately 500 ppm. Memory loss, nausea and vomiting, paralysis of facial muscles or nerve tissue damage may occur after exposures up to 500 ppm. At a concentration of 150 ppm Hydrogen Sulphide, the olfactory nerve is paralyzed. At relatively low concentrations, this product is a simple asphyxiant and may displace oxygen primarily when present in enclosed spaces resulting in chronic hypoxia including effects such as decreased night vision, increased respiration, decreased alertness, fatigue, tunnel vision and headache. Low concentrations may also irritate eyes, skin, respiratory system, central nervous system, and peripheral nervous system.

Chronic effects: (Information based on contaminant effects) Chronic exposure to hydrogen sulphide of 50 ppm or greater may include bronchitis and inflammation of the mucous membranes of the respiratory system. At 250 ppm hydrogen sulphide, chronic effects may include bronchial pneumonia and pulmonary edema. At relatively low concentrations, this

product is a simple asphyxiant and may displace oxygen primarily when present in enclosed spaces resulting in chronic hypoxia including effects such as decreased night vision, increased respiration, decreased alertness, fatigue, tunnel vision and headache. May affect liver and kidney function.

Sensitization: Not available.

Mutagenicity: Not available

Reproductive effects: Not available

Carcinogenicity: Not listed by IARC, NTP or ACGIH. Contaminants may contain benzene that is a known human carcinogen. Exposure may cause aplastic anemia and leukemia (cancer of the bone marrow).

Target organs: Not available

12. Ecological Information

May contain salts. If released into soil, it will absorb and may biodegrade in anaerobic conditions. In water, it may volatilize. Photo-oxidation products include phenol, nitrophenols, nitrobenzene, formic acid and peroxyacetyl nitrate.

13. Disposal Considerations

Water injection in approved wells. Dispose used absorbent in approved landfills or licensed waste reclamation facilities.

14. Transportation Information

PROPER SHIPPING NAME: Not regulated

15. Regulatory Information

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

Workplace Hazardous Materials Information Systems (WHMIS): This product has been classified in accordance with the hazard criteria of the CPR (Controlled Product Regulations), and the MSDS contains all of the information required by the CPR.



Class D1 – Materials Causing Immediate and Serious Toxic Effect

Class D2 – Materials Causing Other Toxic Effects

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)

All components of this product are listed on the Canadian DSL Inventory.

Risk Phrases: 26-36/37/38-51-53



Very toxic by inhalation. Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

Safety Phrases: 16-20/21-29-36/37/39-45-60

Keep away from sources of ignition - No smoking. When using do not eat, drink or smoke. Do not empty into drains. Wear suitable protective clothing, gloves and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately. This material and its container must be disposed of as hazardous waste.

16. Other Information

Prepared for: ARC Resources Safety Department
Preparation information: 403.503.8600
Prepared by: Deerfoot Consulting Inc.

Disclaimer of Expressed and Implied Warranties

The information presented in the Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. However, neither Arc Resources, Deerfoot Consulting Inc nor any of their subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use.

**PRODUCED
WATER,
SWEET**



Material Safety Data Sheet

1. Product and Company Identification

Product Name: Produced Water, Sweet
Synonym: Produced Water
Product use: Produced water is a by-product of petroleum production
Manufacturer: ARC Resources Ltd.
Address: Suite 2100, 440 2nd Street SW
Calgary, AB, T2P 5E9
Emergency Contact: 403-292-0434
CanuteC: (613) 996-6666 or Cellular *666

2. Hazards Identification

EMERGENCY OVERVIEW

This product may be flammable based on impurities. Vapours are heavier than air and may travel considerable distances to a source of ignition and flash back. Vapours may spread along the ground and may enter sewers, basements and other confined spaces.

POTENTIAL HEALTH EFFECTS/ROUTES OF EXPOSURE

Eyes: This product is a moderate eye irritant and chronic exposure may cause hemorrhage of the eye.

Skin: This product is a moderate irritant of the skin and repeated or prolonged contact can defat the skin and lead to dermatitis and possibly skin cancer.

Inhalation: Inhalation may cause headaches, loss of appetite, drowsiness, nausea and vomiting, loss of consciousness and even death. ay also affect the central nervous system, liver and kidneys based on possible contaminants.

Ingestion: If this product is ingested, vomiting and diarrhea may occur. Aspiration of the liquid into the lungs may produce chemical pneumonia, severe lung damage and/or respiratory failure.

3. Composition/Information on Ingredients

Ingredient Name	%	CAS No.	Exposure Limits
Dissolved minerals salts and water	100	Not applicable	Not applicable
Crude oil and hydrocarbons	Trace	8005-02-9	Not applicable

Produced water is a byproduct associated with Natural Gas processing and is injected into the formation.

4. First Aid Measures

Eyes: Immediately flush eyes while holding eyelid open, with lukewarm water for a least 20 minutes. Seek medical attention if irritation persists.



- Skin:** Remove contaminated clothing and launder before wearing. Wash exposed skin with soap and water (waterless hand cleaner may be used if clean water is not readily available). Seek medical attention if irritation persists.
- Inhalation:** Ensure your own safety and use the appropriate respiratory protection to immediately remove the victim to an area free of contaminants. Give CPR or artificial respiration as needed and give oxygen if breathing is difficult. Keep victim at rest and get immediate medical attention.
- Ingestion:** Do not induce vomiting because of the danger of aspiration of liquids into the lungs. Obtain immediate medical attention.

5. Fire Fighting Measures

FLAMMABLE PROPERTIES

The water mixture itself is not flammable but flammable impurities are possible.

HAZARDOUS COMBUSTION PRODUCTS

Contaminants may burn with very smoky flame. Carbon monoxide, carbon dioxide, sulfur dioxide and irritating products of incomplete combustion may be generated.

FIRE AND EXPLOSION HAZARDS

Product contaminant vapours are heavier than air and may travel considerable distances to a source of ignition and flash back. Vapours may spread along the ground and enter sewers, basements and other confined spaces.

EXTINGUISHING MEDIA

Small Fires: Use dry chemicals, CO₂, or alcohol resistant foam.

Large Fires: Use water spray, fog or alcohol resistant foams (with manufacturer's recommended application techniques).

FIRE FIGHTING INSTRUCTIONS

Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers. Consider initial downwind evacuation for at least 800 meters (1/2 mile). Cool containers with large quantities of water until well after the fire has been put out. Do not direct the water stream at the source of the leak or safety devices as icing may occur. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. Fight fires from maximum distance and for massive fires, use unmanned hose holders or monitor nozzles. If this is not possible, withdraw from the area and let the fire burn.

If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

UNUSUAL FIRE & EXPLOSION HAZARDS:

Product contaminant vapours are heavier than air. Vapours may travel considerable distances to a source of ignition and flash back. Vapours may spread along the ground and enter sewers, basements and other confined space.

6. Accidental Release Measures

ACTIVATE SITE SPECIFIC EMERGENCY RESPONSE PLAN, IF AVAILABLE.

Isolate and ventilate area. Consider evacuation and wear positive pressure self-contained breathing apparatus. Remove or shut off all sources of ignition. Avoid skin contact. Use vapour suppressing foam or water spray to reduce vapours. Do not allow liquid to enter sewers, streams or other bodies of water. Place absorbent materials into closed containers or burn in approved combustion chambers.

Small Spills: Use clay or earth to absorb small spills.

Large Spills: Recover liquid and remove contaminated earth.

7. Handling and Storage

HANDLING PRECAUTIONS

Handle as a flammable liquid. Ensure adequate ventilation and keep away from heat, sparks, open flame and other sources of ignition. Ground all drums and transfer vessels when handling. Empty product containers or vessels may contain explosive vapours. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition. Avoid breathing vapours. Wash thoroughly after handling. Electrical equipment must be intrinsically safe. DO NOT siphon by mouth.

STORAGE PRECAUTIONS

Store in a well ventilated area. This storage area should comply with NFPA 30. Avoid storage near incompatible materials such as flammable or combustible materials, oxidizers or materials that support combustion.

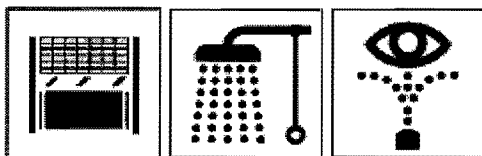
WORK/HYGIENIC PRACTICES

An emergency eye wash station should be available in the vicinity of any potential splash exposure. Use good personal hygiene practices. Avoid skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities and do not eat, drink or smoke in areas of use or storage. Waterless hand cleansers may be used if water is not readily available. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapours which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

SPECIAL PRECAUTIONS

Showers and eyewash stations should be provided within the immediate work area for emergency use when there is an elevated risk of splashing of liquids.

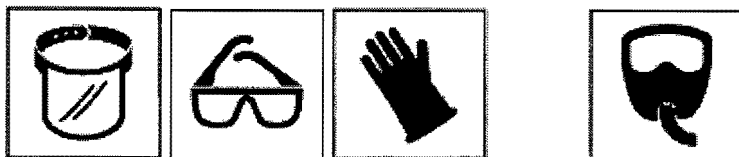
8. Exposure Controls / Personal Protection



ENGINEERING CONTROLS

Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Ensure adequate

ventilation to keep vapor and gas concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces. Ventilation system and other equipment must be intrinsically safe. Showers and/or eyewash fountains should be provided within the immediate work area for emergency use when there is any possibility of exposure to liquids.



PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: Wear chemical goggles or a full face shield when handling this product.

Skin Protection: Avoid skin contact. Wear fire retardant clothing and chemical resistant gloves when handling this product.

Respiratory Protection: Contaminants contained in this product may be known as asphyxiants and air supplied respirators are required if there is a potential for decreased oxygen concentrations. Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece must be worn if the concentration exceeds the OEL (Occupational Exposure Limit) of LELs. When assessing the proper type of respiratory protection, also consider the occupational exposure limits applicable to individual ingredients. Refer to CSA Standard “Selection, Use and Care of Respirators” (Z94.4-02) and NIOSH Respirator Decision Logic for additional guidance on respiratory protection.

Exposure Limits

Ingredient Name	CAS No.	Exposure Limits
Dissolved minerals salts and water	Not applicable	Not applicable
Crude oil and hydrocarbons	8005-02-9	Not applicable

9. Physical and Chemical Properties

Appearance and state:	Clear liquid with slight amber colour
Odour:	Hydrocarbon odour with the potential for rotten egg odour
Odour Threshold:	Not available
Flash Point:	The water mixture itself is not flammable but flammable impurities are possible.
Auto Ignition:	Not applicable
Lower Explosive Limit (%):	Not applicable
Upper Explosive Limit (%):	Not applicable
Boiling Point:	Variable with source
Melting Point:	Variable with source
Vapour Pressure:	Similar to water
Vapour Density (Air = 1):	Not available
Viscosity:	Not available
Specific Gravity:	Not available
Solubility (H ₂ O):	Very soluble
Percent Volatiles:	Not applicable
Evaporation Rate:	Not applicable



10. Stability and Reactivity

STABILITY

Stable

CONDITIONS TO AVOID (STABILITY)

Material is stable under normal conditions. Avoid high temperatures, open flames, sparks, welding, smoking and other ignitions sources.

INCOMPATIBLE MATERIALS

Keep away from strong oxidizers such as peroxides, chlorine, nitrates, perchlorates and mineral acids, ignition sources and heat.

HAZARDOUS DECOMPOSITION PRODUCTS:

Irritating or toxic substances may be emitted upon thermal decomposition. Decomposition products include carbon monoxide, carbon dioxide and sulphur dioxide.

HAZARDOUS POLYMERIZATION

Will Not Occur.

11. Toxicological Information

Chemical Name	CAS No.	LD50	LC50
Dissolved minerals salts and water	Not applicable	Not applicable	Not applicable
Crude oil and hydrocarbons	8005-02-9	Not applicable	Not applicable

POTENTIAL HEALTH EFFECTS

Acute: Low concentrations may also irritate eyes, skin, respiratory system, central nervous system, and peripheral nervous system.

Chronic effects: May affect liver and kidney function.

Sensitization: Not available.

Mutagenicity: Not available

Reproductive effects: Not available

Carcinogenicity: Not listed by IARC, NTP or ACGIH. Contaminants may contain benzene that is a known human carcinogen. Exposure may cause aplastic anemia and leukemia (cancer of the bone marrow).

Target organs: Not available

12. Ecological Information

May contain salts. If released into soil, it will absorb and may biodegrade in anaerobic conditions. In water, it may volatilize. Photo-oxidation products include phenol, nitrophenols, nitrobenzene, formic acid and peroxyacetyl nitrate.

13. Disposal Considerations

Water injection in approved wells. Dispose used absorbent in approved landfills or licensed waste reclamation facilities.



14. Transportation Information

PROPER SHIPPING NAME: Not regulated

15. Regulatory Information

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

Workplace Hazardous Materials Information Systems (WHMIS): This product has been classified in accordance with the hazard criteria of the CPR (Controlled Product Regulations), and the MSDS contains all of the information required by the CPR.

Not controlled

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)

All components of this product are listed on the Canadian DSL Inventory.

Risk Phrases: 26-36/37/38-51-53

Very toxic by inhalation. Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

Safety Phrases: 16-20/21-29-36/37/39-45-60

Keep away from sources of ignition - No smoking. When using do not eat, drink or smoke. Do not empty into drains. Wear suitable protective clothing, gloves and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately. This material and its container must be disposed of as hazardous waste.

16. Other Information

Prepared for: ARC Resources Safety Department
Preparation information: 403.503.8600
Prepared by: Deerfoot Consulting Inc.

Disclaimer of Expressed and Implied Warranties

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