

**ENVIRONMENTAL PRECAUTIONS**

This product should NOT be directly discharged into lakes, ponds, streams, waterways or public water supplies.

As a non-hazardous liquid waste, it should be solidified with stabilizing agents (such as sand, fly ash, or cement) so that no free liquid remains before disposal to an industrial waste landfill. A non-hazardous liquid waste can also be incinerated in accordance with local, state, provincial and federal regulations.

**9. INDUSTRIAL HYGIENE CONTROL MEASURES****OCCUPATIONAL EXPOSURE LIMITS**

This product does not contain any substance that has an established exposure limit.

Respiratory Protection: None normally required.

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a positive pressure, self-contained breathing apparatus is recommended.

Ventilation: General ventilation is recommended.

Eye Protection: Safety glasses, if personally preferred.

Gloves: Generally not necessary. Personal preference. Examples of impermeable gloves available on the market are neoprene, nitrile, PVC, natural rubber, viton, and butyl (compatibility studies have not been performed).

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

**10. TOXICOLOGICAL PROPERTIES****SENSITIZATION**

This product is not expected to be a sensitizer.

A "LC50-96" Pass/Fail Bioassay test. This test determines the lethality of a fluid on young aquatic organisms. The fluid fails if 50% or more of the animals are dead after 96 hours in the fluid.

96 hour static acute LC50 to Rainbow Trout = Greater than 1,000 mg/L

96 hour no observed effect concentration = 125 mg/L based on no mortality or abnormal effects

96 hour static acute LC50 to Sheepshead Minnow = Greater than 1,000 mg/L

96 hour no observed effect concentration = 1,000 mg/L (highest concentration tested) based on no mortality or abnormal effects.

96 hour static acute LC50 to Mysid Shrimp = 400 mg/L

96 hour no observed effect concentration = 180 mg/L based on no mortality or abnormal effects

96 hour static acute LC50 to Daphnia Magna = 400 mg/L

96 hour no observed effect concentration = 56 mg/L (lowest concentration tested) based on no mortality or abnormal effects.

**Microtoxicity**

The Microtox bioassay has been established as the reference test for mud additive toxicity testing.

Test Method: Luminescent Bacteria, IC50@ 15 min

Reference: Appendix 1: Microtox Bioassay Procedure, Drilling Waste Management, Guide G50, 1993, Alberta Energy and Utilities Board, Calgary, AB, Canada.

Sample: Poly Drill 1330, sample #97324-1 for test #970723, 97/05/09 by D. Lintott

Preparation: Sample was diluted to 2 g/L, which formed thick, slightly cloudy liquid. The sample was then centrifuged for 1 hour.

## Test Results:

SAMPLE	TREATMENT	%CTL	IC20%	IC50	RESULT
97324-1	None	N/A	14 (9-22)	>91	PASS

The following results are for a 1% aqueous solution of product.

**CARCINOGENICITY**

None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Government Industrial Hygienists (ACGIH).

**HUMAN HAZARD CHARACTERIZATION**

Based on our Hazard Characterization, the potential human hazard is: LOW

**ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION**

Based on our Hazard Characterization, the potential environmental hazard is: LOW

**11. DEPARTMENT OF TRANSPORTATION INFORMATION**

PROPER SHIPPING NAME/HAZARD CLASS MAY VARY BY PACKAGING, PROPERTIES, AND MODE OF TRANSPORTATION. TYPICAL PROPER SHIPPING NAMES FOR THIS PRODUCT ARE:

ALL TRANSPORTATION MODES      PRODUCT IS NOT REGULATED DURING TRANSPORTATION

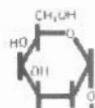
Shipping Name: Liquid Drilling Additive

Hazard Class: Not hazardous

Cautionary Labeling: None required

**14. OTHER INFORMATION**

This information contained herein is given in good faith, but no warranty, expressed or implied is made.


**Poly-Drill Drilling Systems**

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 Calgary, Alberta, Canada T2W-0A8  
 (403) 259-5112 FAX (403) 255-7185  
 email: polydrill@telus.net  
[www.poly-drill.com](http://www.poly-drill.com)
**poly-drill.com**
**MATERIAL SAFETY DATA SHEET/FICHE SIGNALÉTIQUE**
**1. PRODUCT IDENTIFICATION**

 PRODUCT TRADE NAME(S): Poly Drill O.B.X  
 WHMIS CLASSIFICATION: Non-regulated  
 TDG Classification: Non dangerous goods  
 DATE: January 17, 2004

A liquid polymer containing guar gum, mineral oil, vegetable oil, acrylamide copolymer and a surfactant. Evaluation of the ingredient(s) has found no ingredient(s) hazardous as per WHMIS regulations.

**2. PHYSICAL DATA**

 Boiling Point: Not available  
 Specific Gravity: 0.9 g/cm  
 Solubility in Water: disperses in water (forms viscous, slippery solution)  
 pH: 3.8 (1% concentration)  
 Density (g/ml): Not available  
 Physical State: Liquid  
 Appearance and Odor: Brown, Odor slight

**3. FIRE AND EXPLOSION DATA**

 Flash Point (method used): (PMCC) greater than 100 C.  
 Conditions of flammability: Very low risk  
 Hazardous combustion products: None known  
 Upper and Lower flammable limits: Not available  
 Extinguishing media: Carbon dioxide, dry chemicals, foam, in preference to water spray

**4. REACTIVITY**

 Chemical stability: Stable under normal conditions  
 Hazardous Polymerization: Will not occur  
 Incompatible substances: Avoid strong oxidants such as liquid chlorine, concentrated oxygen, sodium or calcium hypo chloride  
 Hazardous decomposition products: None known

**5. HEALTH HAZARD DATA**

TOXICITY RATING: Practically non-harmful.

Routes of Exposure and Effects

SKIN: Slight irritant, prolonged contact may cause skin irritation or dermatitis in some individuals

EYE: No effects of exposure expected with the exception of possible irritation.

INHALATION: Due to low volatility of mineral distillates a small inhalation hazard exists.

INGESTION: can cause nausea, vomiting, cramps, diarrhea  
 Chronic exposure limits: None  
 Sensitization of product: Not suspected to be a sensitizer  
 Teratogenicity: Not available  
 Mutagenicity: Not available  
 Carcinogenicity: None of the components of this product are listed as carcinogens by IARC and ACGIH

## 6. EMERGENCY AND FIRST AID PROCEDURES

**SKIN:** Wash exposed area with soap and water. Remove contaminated clothing. Launder contaminated clothing before re-use. If irritation or abnormalities persist, call a physician.

**EYE:** Immediately flush eyes with water for 15 minutes, lifting upper and lower lids occasionally. Get medical attention.

**INHALATION:** Remove to fresh air. If breathing becomes difficult, give oxygen and call a physician.

**INGESTION:** Do not induce vomiting. Call a physician immediately or poison control center. Never give anything by mouth to an unconscious person. Seek medical advice.

## 8. INDUSTRIAL HYGIENE CONTROL MEASURES

**Respiratory Protection:** None normally required.

**Ventilation:** If mist and/or vapors are present, use air purifying respirator or self-contained breathing apparatus, but this is rarely required.

**Eye Protection:** Safety glasses, if personally preferred.

**Gloves:** Generally not necessary. Personal preference.

## 7. HANDLING AND USE PRECTIONS

**Storage requirements:** keep container closed when not in use. Store in a cool dry location away from oxidizing and reducing agents.

**Waste Disposal:** product should be disposed of in accordance with applicable local, Provincial and Federal regulations.

**Steps must be taken if product is released or spilled:** clean spill areas thoroughly to avoid hazardous slippery conditions.

## 8. TOXICOLOGICAL PROPERTIES

G50 Microtox Analysis prepared by HydroQual Laboratories, Calgary, AB--97/6/26 Test#970978.

Test Description	EC20	EC50	Pass/Fail
MTX	>91	>91	PASS

## 9. DEPARTMENT OF TRANSPORTATION INFORMATION

**Shipping Name:** Liquid Drilling Additive

**Hazard Class:** Not hazardous

**Hazardous Substances:** None

**Cautionary Labeling:** None required

## MATERIAL SAFETY DATA SHEET

### SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

<b>Product Name:</b>	Portland Cement, GU (General use hydraulic cement, formerly Normal Portland Cement), HE (High early-strength hydraulic cement) and HS (High sulphate-resistant hydraulic cement).
<b>CAS #:</b>	65997-15-1
<b>Product Use:</b>	Preparation of concrete and mortar.
<b>MSDS Information:</b>	This MSDS was produced in November, 2002, and replaces any previous versions. This MSDS covers all types of portland cement. Individual composition of constituents will vary within the range shown in Section 2.
<b>Product Code:</b>	Not Applicable
<b>Chemical Family:</b>	Calcium compounds. Calcium silicate compounds and other calcium compounds containing iron and aluminum make up the majority of this product.
<b>Chemical Name And Synonyms:</b>	Portland cement. Portland cement is also known as hydraulic cement and/or normal portland cement.
<b>Formula:</b>	This product consists of finely ground portland cement clinker, gypsum and limestone (for some products).
<b>Supplier/Manufacturer:</b>	Lehigh Inland Cement Limited P.O. Box 3961, Station D, 12640 - 156 Street Edmonton, Alberta, Canada, T5L 4P5 Telephone (780) 420 2500
<b>Emergency Contact Information:</b>	Lehigh Inland Cement Limited P.O. Box 3961, Station D, 12640 - 156 Street Edmonton, Alberta, Canada, T5L 4P5 Telephone (780) 420 2541

### SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

<b>Portland Cement Exposure Limits:</b>	ACGIH TLV-TWA OSHA PEL-TWA OSHA PEL-TWA	10 mg total dust/m <sup>3</sup> 15 mg total dust/m <sup>3</sup> 5 mg respirable dust/m <sup>3</sup>
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#### Portland Cement Ingredients & Their Exposure Limits:

Ingredient	CAS#	% By Weight	ACGIH TLV-TWA	OSHA PEL-TWA
Calcium Silicates	various	60-80%	10 mg total dust/m <sup>3</sup>	15 mg total dust/m <sup>3</sup> 5 mg respirable dust/m <sup>3</sup>
Gypsum	7778-18-9	3-7%	10 mg total dust/m <sup>3</sup>	15 mg total dust/m <sup>3</sup> 5 mg respirable dust/m <sup>3</sup>
Crystalline Silica	14802-60-7	less than 1%	0.10 mg respirable quartz/m <sup>3</sup> NIOSH REL (8-hour TWA) = 0.05 mg respirable quartz dust/m <sup>3</sup>	(10 mg respirable dust/m <sup>3</sup> )/(percent silica+2)
Calcium Carbonate	1317-65-3	0-5%	10 mg total dust/m <sup>3</sup>	15 mg total dust/m <sup>3</sup> 5 mg respirable dust/m <sup>3</sup>
Magnesium Oxide	1305-48-4	1-4%	10 mg total dust/m <sup>3</sup>	10 mg total dust/m <sup>3</sup>
Calcium Oxide	1305-78-8	0.5-1.5%	2 mg total dust/m <sup>3</sup>	5 mg total dust/m <sup>3</sup>

#### Trace Elements:

Portland cement is made from materials mined from the earth and is processed using energy provided by fuels. Trace amounts of chemicals, some of which may be potentially harmful, might be detected during chemical analysis. For example, in addition to the ingredients listed above, portland cement may contain potassium and sodium sulfate compounds, chromium compounds (including up to 0.003% hexavalent chromium) and nickel compounds.

## MATERIAL SAFETY DATA SHEET

### SECTION 3 - HAZARDS IDENTIFICATION

#### Emergency Overview:

Portland cement is a light gray powder that poses little immediate hazard. A single short term exposure to the dry powder is not likely to cause serious harm. However, exposure of sufficient duration to wet portland cement can cause serious, potentially irreversible tissue (skin or eye) destruction in the form of chemical (caustic) burns, including third degree burns. The same type of tissue destruction can occur if wet or moist areas of the body are exposed for sufficient duration to dry portland cement.

#### Potential Health Effects:

- **Relevant routes of exposure are:**

Eye contact, skin contact, inhalation, and ingestion.

#### **Effects Resulting From EYE CONTACT:**

Exposure to airborne dust may cause immediate or delayed irritation or inflammation.

Eye contact by larger amounts of dry powder or splashes of wet portland cement may cause effects ranging from moderate eye irritation to chemical burns and blindness. Such exposures require immediate first aid (see Section 4) and medical attention to prevent significant damage to the eye.

#### **Effects Resulting From SKIN CONTACT:**

Discomfort or pain cannot be relied upon to alert a person to a hazardous skin exposure. Consequently, the only effective means of avoiding skin injury or illness involves minimizing skin contact, particularly contact with wet cement. Exposed persons may not feel discomfort until hours after the exposure has ended and significant injury has occurred.

Exposure to dry portland cement may cause drying of the skin with consequent mild irritation or more significant effects attributable to aggravation of other conditions. Dry portland cement contacting wet skin or exposure to moist or wet portland cement may cause more severe skin effects including thickening, cracking, or fissuring of the skin. Prolonged exposure can cause severe skin damage in the form of caustic chemical burns.

Some individuals may exhibit an allergic response upon exposure to portland cement, possibly due to trace amounts of chromium. The response may appear in a variety of forms ranging from a mild rash to severe skin ulcers. Persons already sensitized may react to their first contact with the product. Other persons may first experience this effect after years of contact with portland cement products.

#### **Effects Resulting From INHALATION:**

Portland cement may contain trace amounts of crystalline silica. Prolonged exposure to respirable free crystalline silica may aggravate other lung conditions. It also may cause delayed lung injury including silicosis, a disabling and potentially fatal lung disease, and/or other diseases. (Also see "Carcinogenic Potential" below.)

Exposure to portland cement may cause irritation to the moist mucous membranes of the nose, throat, and upper respiratory system. It may also leave unpleasant deposits in the nose.

#### **Effects Resulting From INGESTION:**

Although small quantities of dust are not known to be harmful, ill effects are possible if larger quantities are consumed. Portland cement should not be eaten.

- **Carcinogenic Potential:**

Portland cement is not listed as a carcinogen by NTP, OSHA, or IARC. It may, however, contain trace amounts of substances listed as carcinogens by these organizations.

Crystalline silica, a potential trace level contaminant in portland cement, is now classified by IARC as a known human carcinogen (Group 1). NTP has characterized respirable silica as "reasonably anticipated to be [a] carcinogen".

- **Medical Conditions That May Be Aggravated By Inhalation Or Dermal Exposure:**

Pre-existing upper respiratory and lung diseases.  
 Unusual (hyper) sensitivity to hexavalent chromium (chromium<sup>+6</sup>) salts.

## MATERIAL SAFETY DATA SHEET

### SECTION 4 - FIRST-AID MEASURES

**Eyes:**

Immediately flush eyes thoroughly with water. Continue flushing for at least 15 minutes, including under lids, to remove all particles. Call physician immediately.

**Skin:**

Wash skin with cool water and pH-neutral soap or a mild detergent intended for use on skin. Seek medical treatment in all cases of prolonged exposure to wet cement, cement mixtures, liquids from fresh cement products, or prolonged wet skin exposure to dry cement.

**Inhalation Of Airborne Dust:**

Remove to fresh air. Seek medical help if coughing and other symptoms do not subside. ("Inhalation" of gross amounts of portland cement requires immediate medical attention.)

**Ingestion:**

Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician immediately.

### SECTION 5 - FIRE-FIGHTING MEASURES

<b>Flammability:</b>	Not Flammable.
<b>Flash Point:</b>	Not Applicable.
<b>Lower Explosive Limit:</b>	Not Applicable.
<b>Upper Explosive Limit:</b>	Not Applicable.
<b>Auto ignition Temperature:</b>	Not Applicable.
<b>Sensitivity To Static Discharge:</b>	Not Applicable.
<b>Sensitivity To Impact:</b>	Not Applicable.
<b>Extinguishing Media:</b>	Not Applicable.
<b>Special Fire-Fighting Procedures:</b>	None.
<b>Hazardous Combustion Products:</b>	Not Applicable.
<b>Unusual Fire And Explosion Hazards:</b>	Not Applicable.

### SECTION 6 - ACCIDENTAL RELEASE MEASURES

Collect dry material using a scoop. Avoid actions that cause dust to become airborne. Avoid inhalation of dust and contact with skin. Wear appropriate personal protective equipment as described in Section 8.

Scrape up wet material and place in an appropriate container. Allow the material to "dry" before disposal. Do not attempt to wash portland cement down drains.

Dispose of waste material according to local, provincial, state and federal regulations.

### SECTION 7 - HANDLING AND STORAGE

Keep portland cement dry until used. Normal temperatures and pressures do not affect the material.

Promptly remove dusty clothing or clothing which is wet with cement fluids and launder before reuse. Wash thoroughly after exposure to dust or wet cement mixtures or fluids.

## MATERIAL SAFETY DATA SHEET

### SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Eye Protection:

When engaged in activities where cement dust or wet cement or concrete could contact the eye, wear safety glasses with side shields or goggles. In extremely dusty environments and unpredictable environments, wear unvented or indirectly vented goggles to avoid eye irritation or injury. Contact lenses should not be worn when working with portland cement or fresh cement products.

#### Skin Protection:

Prevention is essential to avoiding potentially severe skin injury. Avoid contact with unhardened (wet) portland cement products. If contact occurs, promptly wash affected area with soap and water. Where prolonged exposure to unhardened portland cement products might occur, wear impervious clothing and gloves to eliminate skin contact. Where required, wear boots that are impervious to water to eliminate foot and ankle exposure.

Do not rely on barrier creams: barrier creams should not be used in place of gloves.

Periodically wash areas contacted by dry portland cement or by wet cement or concrete fluids with a pH-neutral soap. Wash again at the end of work. If irritation occurs, immediately wash the affected area and seek treatment. If clothing becomes saturated with wet concrete, it should be removed and replaced with clean dry clothing.

#### Respiratory Protection:

Avoid actions that cause dust to become airborne. Use local or general ventilation to control exposures below applicable exposure limits.

Use NIOSH/MSHA-approved (under 30 CFR 11) or NIOSH-approved (under 42 CFR 84 after July 10, 1998) respirators in poorly ventilated areas, if an applicable exposure limit is exceeded, or when dust causes discomfort or irritation.

#### Ventilation:

Use local exhaust or general dilution ventilation to control exposure within applicable limits.

### SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	White to gray powder
<b>Odor:</b>	No distinct odor
<b>Odor Threshold:</b>	Not applicable
<b>Physical State:</b>	Solid (powder)
<b>pH (as a solid):</b>	Not applicable
<b>pH (in water) (ASTM D 1293-95):</b>	12 to 13
<b>Solubility In Water:</b>	Slightly soluble (0.1 to 1.0 %)
<b>Vapor Pressure:</b>	Not applicable
<b>Vapor Density:</b>	Not applicable
<b>Boiling Point:</b>	Not applicable (i.e., >1000°C)
<b>Freezing Point:</b>	Not applicable
<b>Melting Point:</b>	Not applicable
<b>Specific Gravity (H<sub>2</sub>O = 1.0):</b>	3.15
<b>Evaporation Rate:</b>	Not applicable
<b>Coeff. Water/Oil Dist.:</b>	Not applicable

### SECTION 10 - STABILITY AND REACTIVITY

<b>Stability:</b>	Stable
<b>Conditions to avoid</b>	Unintentional contact with water
<b>Incompatibility:</b>	Portland cement reacts with water to produce a caustic solution, pH 12 to pH 13. Wet portland cement is alkaline. As such it is incompatible with acids, ammonium salts and aluminum metal. Aluminum powder and other alkali and alkaline earth elements will react in wet mortar or concrete, liberating hydrogen gas. Portland cement dissolves in hydrofluoric acid producing corrosive silicon tetrafluoride gas. Silicates react with powerful oxidizers such as fluorine, chlorine, trifluoride and oxygen difluoride.



**MATERIAL SAFETY DATA SHEET**
**SECTION 10 - STABILITY AND REACTIVITY (CONTINUED)**

<b>Hazardous Decomposition:</b>	Will not spontaneously occur. Adding water results in hydration and produces (caustic) calcium hydroxide.
<b>Hazardous Polymerization:</b>	Will not occur.

**SECTION 11 - TOXICOLOGICAL INFORMATION**
**Effects Of Acute Exposure:**

Portland cement and wet portland cement mixtures can dry the skin, cause alkali burns and irritate the eyes and upper respiratory tract. Ingestion can cause irritation of the throat.

**Effects Of Chronic Exposure:**

Portland cement dust can cause inflammation of the tissue lining the interior of the nose and the cornea (white) of the eye.

**SECTION 12 - ECOLOGICAL INFORMATION**

<b>Ecotoxicity:</b>	No recognized unusual toxicity to plants or animals.
<b>Relevant Physical And Chemical Properties:</b>	See Sections 9 and 10.

**SECTION 13 - DISPOSAL CONSIDERATIONS**

Dispose of waste material according to local, provincial, state and federal regulations. (Since portland cement is stable, uncontaminated material may be saved for future use.)

Dispose of bags in an approved landfill or incinerator.

**SECTION 14 - TRANSPORT INFORMATION**

<b>Hazardous materials description/proper shipping name:</b>	Portland cement is not hazardous under the TDG Act (Canada) or DOT regulations (USA).
<b>Hazard Class:</b>	Not applicable.
<b>Identification Number:</b>	Not applicable.
<b>Required Label Text:</b>	Not applicable.
<b>Hazardous substances/reportable quantities (RQ):</b>	Not applicable.

**SECTION 15 - REGULATORY INFORMATION**
**Status under USDOL-OSHA Hazard Communication Rule, 29 CFR 1910.1200:**

Portland cement is considered a "hazardous chemical" under this regulation, and should be part of any hazard communication program.

**Status under CERCLA/Superfund, 40 CFR 117 and 302:**

Not listed.

**Hazard Category under SARA (Title III), Sections 311 and 312:**

Portland cement qualifies as a "hazardous substance" with delayed health effects.

**Status under SARA (Title III), Section 313:**

Not subject to reporting requirements under Section 313.

**MATERIAL SAFETY DATA SHEET****SECTION 15 - REGULATORY INFORMATION (CONTINUED)****Status under TSCA (as of May 1997):**

Some substances in portland cement are on the TSCA inventory list.

**Status under the Federal Hazardous Substances Act:**

Portland cement is a "hazardous substance" subject to statutes promulgated under the subject act.

**Status under California Proposition 65:**

This product contains chemicals (trace metals) known to the State of California to cause cancer, birth defects or other reproductive harm. California law requires the manufacturer to give the above warning in the absence of definitive testing to prove the defined risks do not exist.

**Status under Canadian Environmental Protection Act:**

Not listed.

**Status under WHMIS:**

Portland cement is considered to be a hazardous material under the Hazardous Products Act as defined by the Controlled Products Regulations and is therefore subject to the labeling and MSDS requirements of the Workplace Hazardous Materials Information System (WHMIS).

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

**SECTION 16 - OTHER INFORMATION**

<b>Prepared By:</b>	Robin Cowdrey
<b>Approved By:</b>	Bob Rimes
<b>Approval Date or Revision Date:</b>	September 1, 2004
<b>Date Of Previous MSDS:</b>	November 1, 2002
<b>MSDS Number:</b>	Not Applicable

**Other Important Information:**

Portland cement should only be used by knowledgeable persons. A key to using the product safely requires the user to recognize that portland cement chemically reacts with water, and that some of the intermediate products of this reaction (that is, those present while a portland cement product is "setting") pose a far more severe hazard than does portland cement itself.

While the information provided in this material safety data sheet is believed to provide a useful summary of the hazards of portland cement as it is commonly used, the sheet cannot anticipate and provide all of the information that might be needed in every situation. Inexperienced product users should obtain proper training before using this product.

In particular, the data furnished in this sheet does not address hazards that may be posed by other materials mixed with portland cement to produce portland cement products. Users should review other relevant material safety data sheets before working with this portland cement or working on portland cement products, for example, portland cement concrete.

No representations or warranties with respect to the accuracy or correctness of this information, or of any kind or nature whatsoever, are given, made or intended by Lehigh Inland Cement Limited. No legal responsibility whatsoever is assumed for this information, or for any injuries or damages, however caused which may result from the use of this information. This information is offered solely for informational purposes and is subject to your own independent investigation and verification.

**Superior**  
 Propane Inc.

**MATERIAL SAFETY DATA SHEET**
**SECTION 1 – PRODUCT INFORMATION**

**Product Name:** Propane  
**Trade Name:** LPG (Liquified Petroleum Gas), LP-Gas  
**Chemical Formula:** C<sub>3</sub>H<sub>8</sub>  
**WHMIS CLASSIFICATION**  
 Class A - Compressed Gas  
 Class B, Division 1 - Flammable Gas

**Supplier:** Superior Propane Inc.  
 1111 - 49th Avenue N.E.  
 Calgary, AB T2E 8V2  
**Business:** (403) 730-7500

**Local Market**  
**Emergency Number:** \_\_\_\_\_

(Non Medical)

**Application and Use:** Propane is commonly used as a fuel for heating, cooking, automobiles, forklift trucks, crop drying and welding and cutting operations. Propane is used in industry as a refrigerant, solvent and as a chemical feedstock.

**SECTION 2 – HAZARDOUS INGREDIENTS**

COMPONENTS	CAS NO.	% Volume (v/v)	LD50
Propane	74 -98-6	90% - 99%	Not Applicable
Propylene	115 -07-1	0% - 5%	Not Applicable
Ethane	74 -84-0	0% - 5%	Not Applicable
Butane and heavier hydro carbons	106 -97-8	0% - 2.5%	Not Applicable

**Occupational Exposure Limit:**

Based upon animal test data, the acute toxicity of this product is expected to be inhalation; 4 hour LC50 = 280,000 ppm (Rat).

**Note:** Composition is typical for HD-5 Propane per The Canadian General Standard Board CGSB 3.14 National Standard of Canada. Exact composition will vary from shipment to shipment.

**SECTION 3 – CHEMICAL AND PHYSICAL DATA**

**Form:** Liquid and vapour while stored under pressure.  
**Boiling Point:** -42 °C @ 1 atm.  
**Freezing Point:** -188 °C  
**Evaporation Rate:** Rapid (Gas at normal ambient conditions).  
**Vapour Pressure:** 1435 kPa (maximum) @ 37.8 °C  
**Vapour Density:** 1.52 (Air = 1)  
**Coefficient of Water/Oil Distribution:** Not available  
**pH:** Not available.

**Solubility in water:** Slight, 6.1% by volume @ 17.8 °C  
**Specific Gravity:** 0.51 (water = 1)  
**Appearance/Odour:** Colourless liquid and vapour while stored under pressure. Colourless and odourless gas in natural state at any concentration. Commercial propane has an odourant added, ethyl mercaptan, which has an odour similar to boiling cabbage.  
**Odour Threshold:** 4800 ppm

\* With proper handling, transportation and storage, adding a chemical odourant such as eth-merc has proven to be a very effective warning device, but all odourants have certain limitations. The effectiveness of the odourant may be diminished by a person's sense of smell, by competing odours and by oxidation which may cause a potentially dangerous situation.

**SECTION 4 – FIRE OR EXPLOSION HAZARD**

**Flash Point:** -103.4 °C  
**Method:** Closed cup.  
**Flammable Limits:** Lower 2.4%, Upper 9.5%  
**Auto Ignition Temperature:** 432 °C  
**Products Evolved Due To Heat Or Combustion:** Carbon monoxide can be produced when primary air and secondary air are deficient while combustion is taking place.  
**Fire and Explosive Hazards:** Explosive air-vapour mixtures may form if allowed to leak to atmosphere.  
**Sensitivity To Impact:** No.  
**Sensitivity To Static Discharge:** Yes.

**Fire Extinguishing Precautions:** Use water spray to cool exposed cylinders or tanks. Do not extinguish fire unless the source of the escaping gas that is fueling the fire can be turned off. Fire can be extinguished with carbon dioxide and/or dry chemical (BC). Container metal shells require cooling with water to prevent flame impingement and the weakening of metal. If sufficient water is not available to protect the container shell from weakening, the area will be required to be evacuated. If gas has not ignited, liquid or vapour may be dispersed by water spray or flooding.  
**Special Fire Fighting Equipment:** Protective clothing, hose monitors, fog nozzles, self-contained breathing apparatus.

**SECTION 5 – REACTIVITY DATA**

**Stability:** Stable.  
**Conditions To Avoid:** Keep separate from oxidizing agents. Gas explodes spontaneously when mixed with chloride dioxide.  
**Incompatibility:** Remove sources of ignition and observe distance requirements for storage tanks from combustible material, drains and openings to building.

**Hazardous Decomposition Products:** Deficient primary and secondary air can produce carbon monoxide.  
**Hazardous Polymerization:** Will not occur.

**SECTION 6 – TOXICOLOGICAL PROPERTIES OF MATERIAL**
**ROUTES OF ENTRY:**

**Inhalation:** Simple asphyxiant. No effect at concentrations of 10,000 ppm (peak exposures). Higher concentrations may cause central nervous system disorder and/or damage. Lack of oxygen may cause dizziness, loss of coordination, weakness, fatigue, euphoria, mental confusion, blurred vision, convulsions, breathing failure, coma and death. Breathing high vapour concentrations (saturated vapours) for a few minutes may be fatal. Saturated vapours may be encountered in confined spaces and/or under conditions of poor ventilation. Avoid breathing vapours or mist.

**Skin and Eye Contact:** Exposure to vapourizing liquid may cause frostbite (cold burns) and permanent eye damage.

**Ingestion:** Not considered to be a hazard.

**Acute Exposure:** The acute toxicity of this product is expected to be inhalation: 4 hour LC50=280,000ppm (Rat).

**Chronic Exposure:** There are no reported effects from long term low level exposure.

**Sensitization to Product:** Skin-unknown, Respiratory-unknown.

**Occupational Exposure Limits:** American Conference of Governmental Industrial Hygienists (ACGIH) lists as a simple asphyxiant. ACGIH TLV: 1000 ppm.

**Carcinogenicity, Reproductive Toxicity, Teratogenicity, Mutagenicity:** No effects reported.

**SECTION 7 – PREVENTIVE MEASURES**

**Eyes:** Safety glasses, are recommended when transferring product.

**Skin:** Insulated gloves required if contact with liquid or liquid cooled equipment is expected. Wear gloves and long sleeves when transferring product.

**Inhalation:** Where concentration in air would reduce the oxygen level below 18% air or exceed occupational exposure limits in section 6, self-contained breathing apparatus is required.

**Ventilation:** Explosion proof ventilation equipment required in confined spaces.

**SECTION 8 – EMERGENCY AND FIRST AID PROCEDURES**
**FIRST AID:**

**Eyes:** Should eye contact with liquid occur, flush eyes with lukewarm water for 15 minutes. Obtain immediate medical care.

**Skin:** In case of "Cold Burn" from contact with liquid, immediately place affected area in lukewarm water and keep at this temperature until circulation returns. If fingers or hands are frostbitten, have the victim hold his hand next to his body such as under the armpit. Obtain immediate medical care.

**Ingestion:** None considered necessary.

**Inhalation:** Remove person to fresh air. If breathing is difficult or has stopped, administer artificial respiration. Obtain immediate medical care.

**SPILL OR LEAK:**

Eliminate leak if possible.

Eliminate source of ignition.

Ensure cylinder is upright.

Disperse vapours with hose streams using fog nozzles. Monitor low areas as propane is heavier than air and can settle into low areas. Remain upwind of leak. Keep people away. Prevent vapour and/or liquid from entering into sewers, basements or confined areas.

**SECTION 9 – TRANSPORTATION, HANDLING AND STORAGE**

– Transport and store cylinders and tanks secured in an upright position in a ventilated space away from ignition sources (so the pressure relief valve is in contact with the vapour space of the cylinder or tank).

– Cylinders that are not in use must have the valves in the closed position and be equipped with a protective cap or guard.

– Do not store with oxidizing agents, oxygen, or chlorine cylinders.

– Empty cylinders and tanks may contain product residue. Do not pressurize, cut, heat or weld empty containers.

– Transport, handle and store according to applicable federal and provincial codes and regulations.

**Transportation of Dangerous Goods (TDG)**

– TDG Classification: Flammable Gas 2.1

– TDG Shipping Name: Liquefied Petroleum Gas (Propane)

– TDG Special Provisions: 56, 90, 102

PIN Number: UN1075




**SECTION 10 – PREPARATION**

Superior Propane Inc., Regulations & Safety Department, (403) 730-7500 Date prepared: November 2001.  
 Supersedes: September 1999.

The information contained herein is believed to be accurate. It is provided independently of any sale of the product. It is not intended to constitute performance information concerning the product. No express warranty, implied warranty of merchantability or fitness for a particular purpose is made with respect to the product information contained herein.



## Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing	TDG (pictograms)
	Not controlled		

### Section 1. Chemical Product and Company Identification

Product Name	<b>DRILL ROD HEAVY GREASE</b>	Code	650-265 DRODH
Synonym	Not available.	DSL	See Section 15
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	TSCA	See Section 15
Material Uses	This product is recommended for the lubrication of diamond drill rods.	In case of Emergency	Petro-Canada, 403-296-3000 Canotec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).

### Section 2. Composition and Information on Ingredients

Name	CAS #	%(W/W)	Exposure Limits (ACGIH)		
			TLV-TWA(8h)	STEL	CEILING
1) Mixture of severely hydrotreated and hydrocracked, and/or solvent-refined base oil (petroleum) and other proprietary, non-hazardous additives.	Mixture	100	5 mg/m <sup>3</sup> (oil mist)	10 mg/m <sup>3</sup> (oil mist)	Not established

### Section 3. Hazards Identification

Potential Health Effects	Non irritating to slight transient irritation to skin and eyes, but no permanent damage. Relatively non-toxic via ingestion. This product has a low vapour pressure and is not expected to present an inhalation exposure at ambient conditions. Upon heating to high temperatures, or mechanical actions which may produce vapours or mists, inhalation of product may cause irritation of the breathing passages. For more information, refer to Section 11.
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### Section 4. First Aid Measures

Eye Contact	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. High pressure grease gun is capable of injecting grease through the skin. Grease gun injuries require immediate physician assessment. Seek medical attention.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.
Note to Physician	Not available.

### Section 5. Fire-fighting Measures

Flammability	May be combustible at high temperature.	Flammable Limits	Not available.
Flash Points	Mineral Oil Blend: OPEN CUP: 252 C (485.6 F) (Cleveland).	Auto-Ignition Temperature	Not available.
Fire Hazards in Presence of Various Substances	Low fire hazard. This material must be heated before ignition will occur.	Explosion Hazards in Presence of Various Substances	Containers may explode in heat of fire. Do not cut, weld, heat, drill or pressurize empty container.
Products of Combustion	Carbon oxides (CO, CO <sub>2</sub> ), smoke and irritating vapours as products of incomplete combustion.		
Fire Fighting Media and Instructions	NAERG96, GUIDE 171, Substances (low to moderate hazard): If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (0.5 mile) in all directions; also, consider initial evacuation for 800 meters (0.5 mile) in all directions. Shut off fuel to fire if it is possible to do so without hazard. If this is impossible, withdraw from area and let fire burn out under controlled conditions. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire. Cool containing vessels with water spray in order to prevent pressure build-up, autoignition or explosion. SMALL FIRE: use DRY chemicals, foam, water spray or CO <sub>2</sub> . LARGE FIRE: use water spray, fog or foam. For small outdoor fires, portable fire extinguishers may be used and self contained breathing apparatus (SCBA) may not be required. For all indoor fires and any significant outdoor fires, SCBA is required. Respiratory and eye protection are required for fire fighting personnel.		

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**DRILL ROD HEAVY GREASE**

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**Section 6. Accidental Release Measures**

<b>Material Release or Spill</b>	Consult current National Emergency Response Guide Book (NERG) for appropriate spill measures if necessary. Extinguish all ignition sources. Stop leak if safe to do so. Dike spilled material. Use appropriate inert absorbent material to absorb spilled product. Collect used absorbent for later disposal. Avoid contact with spilled material. Avoid contaminating sewers, streams, rivers and other water courses with spilled material. Notify appropriate authorities immediately.
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**Section 7. Handling and Storage**

<b>Handling</b>	Avoid contact with any sources of ignition, flames, heat, and sparks. Avoid skin contact. Avoid eye contact. Avoid inhalation of product vapours or mists. Empty containers may contain product residue. Do not pressurize, cut, heat, or weld empty containers. Do not reuse containers without commercial cleaning and/or reconditioning. Personnel who handle this material should practice good personal hygiene during and after handling to help prevent accidental ingestion of this product. Properly dispose of contaminated leather articles including shoes that cannot be decontaminated.
<b>Storage</b>	Store in dry, cool, well-ventilated area. Keep container tightly closed. Store away from incompatible and reactive materials (See section 5 and 10).

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

<b>Engineering Controls</b>	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work station.
<b>Personal Protection</b>	<i>The selection of personal protective equipment varies, depending upon conditions of use.</i>
<b>Eyes</b>	Eye protection (i.e. safety glasses, safety goggles and/or face shield) should be determined based on conditions of use. If product is used in an application where splashing may occur, the use of safety goggles and/or a face shield should be considered.
<b>Body</b>	Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.
<b>Respiratory</b>	Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) and where engineering, work practices or other means of exposure reduction are not adequate, NIOSH approved respirators may be necessary to prevent overexposure by inhalation.
<b>Hands</b>	Wear appropriate chemically protective gloves. When handling hot product ensure gloves are heat resistant and insulated.
<b>Feet</b>	Wear appropriate footwear to prevent product from coming in contact with feet and skin.
<b>Exposure Limits</b>	Consult local, state, provincial or territory authorities for acceptable exposure limits. This product is not expected to form a mist based on its properties and expected use.

**Section 9. Physical and Chemical Properties**

<b>Physical State and Appearance</b>	Paste of long fibred texture.	<b>Viscosity</b>	Mineral Oil Blend: 155.5 cSt @ 40°C (104°F), 14.42 cSt @ 100°C (212°F) VI=89
<b>Colour</b>	Dark greenish-brown	<b>Pour Point</b>	Mineral Oil Blend: -15°C (5°F)
<b>Odour</b>	Mild grease like.	<b>Softening Point</b>	Not available
<b>Odour Threshold</b>	Not available	<b>Dropping Point</b>	201°C (394°F)
<b>Boiling Point</b>	Not available	<b>Penetration</b>	234 (60 strokes)
<b>Specific Gravity</b>	Mineral Oil Blend: 0.8898 kg/L @ 15°C (59°F)	<b>Oil/Water Dist. Coeff.</b>	Not available
<b>Vapor Density</b>	Not available	<b>Ionicity (in water)</b>	Not available
<b>Vapor Pressure</b>	Negligible at ambient temperature and pressure.	<b>Dispersion Properties</b>	Not available.
<b>Volatility</b>	Non-volatile	<b>Solubility</b>	Insoluble in water.

**Section 10. Stability and Reactivity**

<b>Corrosivity</b>	Not corrosive to copper.	<b>Hazardous Polymerization</b>	Will not occur under normal working conditions.
<b>Stability</b>	The product is stable under normal handling and storage conditions.	<b>Decomposition Products</b>	May release COx, NOx, SOx, diphenylamine, alkenes, smoke and irritating vapours when heated to decomposition.
<b>Incompatible Substances / Conditions to Avoid</b>	Reactive with oxidizing agents, acids and alkalis.		

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**DRILL ROD HEAVY GREASE**

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**Section 11. Toxicological Information**

<b>Routes of Entry</b>	Skin contact, eye contact, inhalation and ingestion.
<b>Acute Lethality</b>	Based on toxicity of components. Acute oral toxicity (LD50): >5000 mg/kg (rat). Acute dermal toxicity (LD50): >2000 mg/kg (rabbit).
<b>Chronic or Other Toxic Effects</b>	
Dermal Route	Prolonged or repeated contact may cause skin irritation characterized by dermatitis or oil acne.
Inhalation Route	Negligible breathing hazard at normal temperatures (up to 38 °C) or recommended blending temperatures. Elevated temperatures or mechanical action may form vapours, mists or fumes. Inhalation of oil mists or vapours from hot oil may cause irritation of the upper respiratory tract.
Oral Route:	Low toxicity; has laxative effect.
Eye Irritation/Inflammation	Repeated or prolonged contact may cause transient irritation, but no permanent damage.
Immunotoxicity:	Not available.
Skin Sensitization	This product is not expected to be a skin sensitizer, based on the available data and the known hazards of the components.
Respiratory Tract Sensitization:	This product is not expected to be a respiratory tract sensitizer, based on the available data and the known hazards of the components.
Mutagenic:	Based on actual test results of base oils and results of similar products, severely hydrotreated base oils give negative results when tested for: (a) Salmonella Typhimurium TA98 using the Modified Ames Assay for Petroleum Product; (b) Salmonella-Escherichia coli/Mammalian-Microsome Reverse Mutation Assay (Ames test) with a Confirmatory Assay; (c) Structural Chromosomal Aberrations in Chinese Hamster Ovary (CHO) Cells.
Reproductive Toxicity	This product is not expected to be a reproductive hazard, based on the available data and the known hazards of the components.
Teratogenicity/Embryotox	This product is not expected to be a teratogen or an embryotoxin, based on the available data and the known hazards of the components.
Carcinogenicity (ACGIH)	This product is not known to contain any chemicals at reportable quantities that are listed as A1 or A2 carcinogens by ACGIH.
Carcinogenicity (IARC)	This product is not known to contain any chemicals at reportable quantities that are listed as group 1, 2A or 2B carcinogens by IARC.
Carcinogenicity (NTP)	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by NTP.
Carcinogenicity (IRIS)	Not available.
Carcinogenicity (OSHA)	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by OSHA.
<b>Other Considerations</b>	No additional remark.

**Section 12. Ecological Information**

<b>Environmental Fate</b>	Not available.	<b>Persistence/ Bioaccumulation Potential</b>	Not available.
<b>BOD5 and COD</b>	Not available.	<b>Products of Biodegradation</b>	Not available.
<b>Additional Remarks</b>	No additional remark.		

**Section 13. Disposal Considerations**

<b>Waste Disposal</b>	Spent/ used/ waste product may meet the requirements of a hazardous waste. Consult your local or regional authorities. Ensure that waste management processes are in compliance with government requirements and local disposal regulations.
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**Section 14. Transport Information**

<b>TDG Classification</b>	Not controlled under TDG (Canada).	<b>Special Provisions for Transport</b>	Not applicable.
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**DRILL ROD HEAVY GREASE**

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**Section 15. Regulatory Information**

Other Regulations	This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List).																						
	All components of this formulation are listed on the US EPA-TSCA Inventory.																						
	This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.																						
	Please contact Product Safety for more information.																						
DSD/DPD (Europe)	Not evaluated.																						
DSD/DPD (Europe) (Pictograms)	NOT EVALUATED FOR EUROPEAN TRANSPORT  NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN	DOT (U.S.A.) (Pictograms)																					
HMIS (U.S.A.)	<table><tr><td>Health Hazard</td><td>1</td></tr><tr><td>Fire Hazard</td><td>1</td></tr><tr><td>Reactivity</td><td>0</td></tr><tr><td>Personal Protection</td><td>3</td></tr></table>	Health Hazard	1	Fire Hazard	1	Reactivity	0	Personal Protection	3	NFPA (U.S.A.)	<table><tr><td></td><td></td><td>Fire Hazard</td><td></td></tr><tr><td>Health</td><td>1</td><td>0</td><td>Reactivity</td></tr><tr><td></td><td></td><td>Specific hazard</td><td></td></tr></table>			Fire Hazard		Health	1	0	Reactivity			Specific hazard	
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Fire Hazard	1																						
Reactivity	0																						
Personal Protection	3																						
		Fire Hazard																					
Health	1	0	Reactivity																				
		Specific hazard																					




**Section 16. Other Information**

<b>References</b>	Available upon request. * Marque de commerce de Petro-Canada - Trademark		
<b>Glossary</b>	<div style="display: flex;"> <div style="flex: 1;"> <p>ACGIH - American Conference of Governmental Industrial Hygienists</p> <p>ADR - Agreement on Dangerous goods by Road (Europe)</p> <p>ASTM - American Society for Testing and Materials</p> <p>BOD<sub>5</sub> - Biological Oxygen Demand in 5 days</p> <p>CAN/CGA B149.2 - Propane Installation Code</p> <p>CAS - Chemical Abstract Services</p> <p>CEPA - Canadian Environmental Protection Act</p> <p>CERCLA - Comprehensive Environmental Response, Compensation and Liability Act</p> <p>CFR - Code of Federal Regulations</p> <p>CHIP - Chemicals Hazard Information and Packaging Approved Supply List</p> <p>COD<sub>5</sub> - Chemical Oxygen Demand in 5 days</p> <p>CPR - Controlled Products Regulations</p> <p>DOT - Department of Transport</p> <p>DSL - Dangerous Substances Classification and Labeling (Europe)</p> <p>DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)</p> <p>DSL - Domestic Substance List</p> <p>EEC/EU - European Economic Community/European Union</p> <p>EINECS - European Inventory of Existing Commercial Chemical Substances</p> <p>EPCRA - Emergency Planning and Community Right to Know Act</p> <p>FDA - Food and Drug Administration</p> <p>FIFRA - Federal Insecticide, Fungicide and Rodenticide Act</p> <p>HCS - Hazardous Communication System</p> <p>HMIS - Hazardous Material Information System</p> <p>IARC - International Agency for Research on Cancer</p> </div> <div style="flex: 1;"> <p>IRIS - Integrated Risk Information System</p> <p>LD<sub>50</sub>/LC<sub>50</sub> - Lethal Dose/Concentration kill 50%</p> <p>LDLo/LCLo - Lowest Published Lethal Dose/Concentration</p> <p>HAER/G'96 - North American Emergency Response Guide Book (1996)</p> <p>NFPA - National Fire Prevention Association</p> <p>NIOSH - National Institute for Occupational Safety &amp; Health</p> <p>NPRI - National Pollutant Release Inventory</p> <p>NSNR - New Substances Notification Regulations (Canada)</p> <p>HTP - National Toxicology Program</p> <p>OSHA - Occupational Safety &amp; Health Administration</p> <p>PEL - Permissible Exposure Limit</p> <p>RCRA - Resource Conservation and Recovery Act</p> <p>SARA - Superfund Amendments and Reorganization Act</p> <p>SD - Single Dose</p> <p>STEL - Short Term Exposure Limit (15 minutes)</p> <p>TDG - Transportation Dangerous Goods (Canada)</p> <p>TDLo/TCLo - Lowest Published Toxic Dose/Concentration</p> <p>TLM - Median Tolerance Limit</p> <p>TLV-TWA - Threshold Limit Value-Time Weighted Average</p> <p>TSCA - Toxic Substances Control Act</p> <p>USEPA - United States Environmental Protection Agency</p> <p>USP - United States Pharmacopoeia</p> <p>WHMIS - Workplace Hazardous Material Information System</p> </div> </div>		
<b>Information Contact</b>	<p>Internet: <a href="http://www.petro-canada.ca">www.petro-canada.ca</a></p> <p><b>Lubricants:</b></p> <p>Western Canada, telephone: 1-800-661-1199;</p> <p>fax: (780) 464-9564</p> <p>Ontario &amp; Central Canada, telephone:</p> <p>1-800-268-5850 and (905) 822-4222; fax:</p> <p>1-800-201-6285</p> <p>Quebec &amp; Eastern Canada, telephone:</p> <p>1-800-576-1686; fax: 800-201-6285</p> <p>For Product Safety Information: (905) 804-4752</p>		
	<p>Prepared by Product Safety - JDW on 4/29/2003.</p> <p>Data entry by Product Safety - JDW.</p>		

*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.*



## Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing	TDG (pictograms)
	<b>Not controlled</b>		

### Section 1. Chemical Product and Company Identification

Product Name	<b>TOOL JOINT COMPOUND</b>	Code	650-774 TOOL
Synonym	Not available.	DSL	See Section 15
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	TSCA	See Section 15
Material Uses	Tool Joint Compound is used in drilling operations as a thread compound for rotary shouldered pipe connections to prevent galling and to provide a positive seal against drilling mud pressure.	In case of Emergency	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).

### Section 2. Composition and Information on Ingredients

Name	CAS #	% (W/W)	Exposure Limits (ACGIH)		
			TLV-TWA(8h)	STEL	CEILING
1) Proprietary ingredients. 2) Mica	Not available. 12001-26-2	≥90 ≤10	Not available. 3 mg/m <sup>3</sup>	Not available. Not established	Not available. Not established

### Section 3. Hazards Identification.

Potential Health Effects	Non irritating to slight transient irritation to skin and eyes, but no permanent damage. Relatively non-toxic via ingestion. This product has a low vapour pressure and is not expected to present an inhalation exposure at ambient conditions. Upon heating to high temperatures, or mechanical actions which may produce vapours or mists, inhalation of product may cause irritation of the breathing passages. For more information, refer to Section 11.
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### Section 4. First Aid Measures

Eye Contact	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. High pressure grease gun is capable of injecting grease through the skin. Grease gun injuries require immediate physician assessment. Seek medical attention.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.
Note to Physician	Not available.

### Section 5. Fire-fighting Measures

Flammability	May be combustible at high temperature	Flammable Limits	Lower: 0.9%, Upper: 7%
Flash Points	Mineral Oil Blend OPEN CUP: 250 °C (482 °F) (Cleveland)	Auto-Ignition Temperature	>260 °C (500 °F)
Fire Hazards in Presence of Various Substances	Low fire hazard. This material must be heated before ignition will occur.	Explosion Hazards in Presence of Various Substances	Do not cut, weld, heat, drill or pressurize empty container. Containers may explode in heat of fire.
Products of Combustion	Carbon oxides (CO, CO <sub>2</sub> ), nitrogen oxides (NO <sub>x</sub> ), sulphur oxides (SO <sub>x</sub> ), hydrocarbons, metal oxides, smoke and irritating vapours as products of incomplete combustion.		
Fire Fighting Media and Instructions	NAERG96, GUIDE 171, Substances (low to moderate hazard). If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (0.5 mile) in all directions; also, consider initial evacuation for 800 meters (0.5 mile) in all directions. Shut off fuel to fire if it is possible to do so without hazard. If this is impossible, withdraw from area and let fire burn out under controlled conditions. Withdraw immediately in case of rising sound from venting safety device or any discolouration of tank due to fire. Cool containing vessels with water spray in order to prevent pressure build-up, autoignition or explosion. SMALL FIRE: use DRY chemicals, foam, water spray or CO <sub>2</sub> . LARGE FIRE: use water spray, fog or foam. For small outdoor fires, portable fire extinguishers may be used, and self contained breathing apparatus (SCBA) may not be required. For all indoor fires and any significant outdoor fires, SCBA is required. Respiratory and eye protection are required for fire fighting personnel.		

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TOOL JOINT COMPOUND

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**Section 6. Accidental Release Measures**

Material Release or Spill	NAERG96: GUIDE 171: Substances (low to moderate hazard): ELIMINATE ALL IGNITION SOURCES. Avoid contact. Stop leak if without risk. Contain spill. Absorb with inert absorbents: dry clay or diatomaceous earth. Avoid inhaling dust of diatomaceous earth for it may contain silica in very fine particle size, making this a potential respiratory hazard. Place used absorbent in closed metal containers for later disposal or burn absorbent in a suitable combustion chamber. DO NOT FLUSH TO SEWERS, STREAMS OR OTHER BODIES OF WATER. Check with applicable jurisdiction for specific disposal requirements of spilled material and empty containers. Notify the appropriate authorities immediately.
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**Section 7. Handling and Storage**

Handling	Keep away from sources of ignition. DO NOT reuse empty containers without commercial cleaning or reconditioning. Practice good personal hygiene. Wash hands after handling and before eating. Launder work clothes frequently. Discard saturated leather goods.
Storage	Store in tightly closed containers in cool, dry, isolated, well-ventilated area, and away from incompatibles.

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

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work station.
Personal Protection - <i>The selection of personal protective equipment varies, depending upon conditions of use.</i>	
Eyes	Eye protection (i.e., safety glasses, safety goggles and/or face shield) should be determined based on conditions of use. If product is used in an application where splashing may occur, the use of safety goggles and/or a face shield should be considered.
Body	Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.
Respiratory	Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) and where engineering, work practices or other means of exposure reduction are not adequate, NIOSH approved respirators may be necessary to prevent overexposure by inhalation.
Hands	Wear appropriate chemically protective gloves. When handling hot product ensure gloves are heat resistant and insulated.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.
Exposure Limits	Consult local authorities for acceptable exposure limits. This product is not expected to form a mist based on its properties and expected use.

**Section 9. Physical and Chemical Properties**

Physical State and Appearance	Smooth buttery paste.	Viscosity	Mineral Oil Blend: 103.3 cSt @ 40°C; 11.5 cSt @ 100°C, VI=98
Colour	Grey.	Pour Point	Mineral Oil Blend: -15°C
Odour	Mild petroleum odour.	Softening Point	Not available.
Odour Threshold	Not available.	Dropping Point	196°C
Boiling Point	<316°C (600°F)	Penetration	280 (60 strokes)
Specific Gravity	Mineral Oil Blend: 0.8741 kg/L @ 15°C (59°F)	Oil / Water Dist. Coeff.	Not available.
Vapor Density	Not available.	Toxicity (In water)	Not available.
Vapor Pressure	Negligible at ambient temperature and pressure.	Dispersion Properties	Not available.
Volatility	Non-volatile.	Solubility	Insoluble in water.

**Section 10. Stability and Reactivity**

Corrosivity	Not available.		
Stability	The product is stable under normal handling and storage conditions.	Hazardous Polymerization	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Reactive with oxidizing agents and acids.	Decomposition Products	May release COx, NOx, SOx, hydrocarbons, metal oxides, smoke and irritating vapours when heated to decomposition.

**Section 11. Toxicological Information**

Routes of Entry	Skin contact, eye contact, inhalation, and ingestion.
Acute Lethality	Not available.
Chronic or Other Toxic Effects	
Dermal Route	Prolonged or repeated contact may cause skin irritation characterized by dermatitis or oil acne.
Inhalation Route	Negligible breathing hazard at normal temperatures (up to 38°C) or recommended blending temperatures. Elevated temperatures or mechanical action may form vapours, mists or fumes. Inhalation of oil mists or vapours from hot oil may cause irritation of the upper respiratory tract.
Oral Route	Low toxicity; has laxative effect.

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TOOL JOINT COMPOUND		Page Number: 3
Eye Irritation/Inflammation	Repeated or prolonged contact may cause transient irritation, but no permanent damage.	
Immunotoxicity	Not available.	
Skin Sensitization	This product is not expected to be a skin sensitizer, based on the available data and the known hazards of the components.	
Respiratory Tract Sensitization	This product is not expected to be a respiratory tract sensitizer, based on the available data and the known hazards of the components.	
Mutagenic	This product is not expected to be a mutagen, based on the available data and the known hazards of the components.	
Reproductive Toxicity	This product is not expected to be a reproductive hazard, based on the available data and the known hazards of the components.	
Teratogenicity/Embryotoxicity	This product is not expected to be a teratogen or an embryotoxin, based on the available data and the known hazards of the components.	
Carcinogenicity (ACGIH)	Not available.	
Carcinogenicity (IARC)	This product is not known to contain any chemicals at reportable quantities that are listed as group 1, 2A or 2B carcinogens by IARC.	
Carcinogenicity (NTP)	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by NTP.	
Carcinogenicity (IRIS)	Not available.	
Carcinogenicity (OSHA)	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by OSHA.	
Other Considerations	No additional remark.	

Section 12. Ecological Information			
Environmental Fate	Not available.	Persistence/Bioaccumulation Potential	Not available.
BOD5 and COD	Not available.	Products of Biodegradation	Not available.
Additional Remarks	No additional remark.		

Section 13. Disposal Considerations	
Waste Disposal	Preferred waste management priorities are: (1) recycle or reprocess; (2) incineration with energy recovery; (3) disposal at licensed waste disposal facility. Ensure that disposal or reprocessing is in compliance with government requirements and local disposal regulations. Consult your local or regional authorities.

Section 14. Transport Information			
TDG Classification	Not controlled under TDG (Canada).	Special Provisions for Transport	Not applicable.

Section 15. Regulatory Information																				
Other Regulations	<p>This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List).</p> <p>All components of this formulation are listed on the US EPA-TSCA Inventory.</p> <p>This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.</p> <p>Please contact Product Safety for more information.</p>																			
DSD/DPD (Europe)	Not evaluated.																			
DSD/DPD (Europe) (Pictograms)	<p>NOT EVALUATED FOR EUROPEAN TRANSPORT</p> <p>NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN</p>	DOT (U.S.A.) (Pictograms)																		
HMIS (U.S.A.)	<table><tr><td>Health Hazard</td><td>1</td></tr><tr><td>Fire Hazard</td><td>1</td></tr><tr><td>Reactivity</td><td>1</td></tr><tr><td>Personal Protection</td><td>H</td></tr></table>	Health Hazard	1	Fire Hazard	1	Reactivity	1	Personal Protection	H	NFPA (U.S.A.)	<table><tr><td>Health</td><td></td><td>Fire Hazard</td></tr><tr><td></td><td></td><td>Reactivity</td></tr><tr><td></td><td></td><td>Specific hazard</td></tr></table>	Health		Fire Hazard			Reactivity			Specific hazard
Health Hazard	1																			
Fire Hazard	1																			
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Personal Protection	H																			
Health		Fire Hazard																		
		Reactivity																		
		Specific hazard																		

TOOL JOINT COMPOUND		Page Number: 4
Section 16. Other Information		
References	Available upon request * Marque de commerce de Petro-Canada - Trademark	
Glossary		
<p>ACGIH - American Conference of Governmental Industrial Hygienists          ADR - Agreement on Dangerous goods by Road (Europe)          ASTM - American Society for Testing and Materials          BOD5 - Biological Oxygen Demand in 5 days          CAN/CSA B149.2 - Propane Installation Code          CAS - Chemical Abstract Services          CEPA - Canadian Environmental Protection Act          CERCLA - Comprehensive Environmental Response, Compensation and Liability Act          CFR - Code of Federal Regulations          CHIP - Chemicals Hazard Information and Packaging Approved Supply List          COD5 - Chemical Oxygen Demand in 5 days          CPR - Controlled Products Regulations          DOT - Department of Transport          DSGCL - Dangerous Substances Classification and Labeling (Europe)          DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)          DSL - Domestic Substance List          EEC/EU - European Economic Community/European Union          EINECS - European Inventory of Existing Commercial Chemical Substances          EPCRA - Emergency Planning and Community Right-to-Know Act          FDA - Food and Drug Administration          FIFRA - Federal Insecticide, Fungicide and Rodenticide Act          HCS - Hazardous Communication System          HMIS - Hazardous Material Information System          IARC - International Agency for Research on Cancer</p>		
<p>IRIS - Integrated Risk Information System          LD50/LC50 - Lethal Dose/Concentration kill 50%          LDLo/LCLo - Lowest Published Lethal Dose/Concentration          NAERG'96 - North American Emergency Response Guide Book, 1996          NFPA - National Fire Protection Association          NIOSH - National Institute for Occupational Safety &amp; Health          NPLRI - National Pollutant Release Inventory          NSMR - New Substances Notification Regulations (Canada)          NTP - National Toxicology Program          OSHA - Occupational Safety &amp; Health Administration          PEL - Permissible Exposure Limit          RCRA - Resource Conservation and Recovery Act          SARA - Superfund Amendments and Reorganization Act          SD - Single Dose          STEL - Short Term Exposure Limit (15 minutes)          TDS - Transportation Dangerous Goods (Canada)          TDLo/TCLo - Lowest Published Toxic Dose/Concentration          Tm - Median Tolerance Limit          TLV-TWA - Threshold Limit Value-Time Weighted Average          TSCA - Toxic Substances Control Act          USEPA - United States Environmental Protection Agency          USP - United States Pharmacopoeia          WHMIS - Workplace Hazardous Material Information System</p>		
<b>Information Contact</b> Internet: <a href="http://www.petro-canada.ca">www.petro-canada.ca</a>  <b>Lubricants:</b> Western Canada, telephone: 1-800-661-1199; fax: (780) 464-9564 Ontario & Central Canada, telephone: 1-800-268-5850 and (905) 822-4222; fax: 1-800-201-6285 Quebec & Eastern Canada, telephone: 1-800-576-1686; fax: 800-201-6285  For Product Safety Information: (905) 804-4752		<b>Prepared by Product Safety - JDW on 12/18/2002.</b>  <b>Data entry by Product Safety - JDW.</b>
<i>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.</i>		