

PETROL FUEL		Page Number: 3
OSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe) DSL - Domestic Substances List EEC/ECU - 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		
TDG - Transportation Dangerous Goods (Canada) TDLo/TLCo - Lowest Published Toxic Dose/Concentration TLN - 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		
For Copy of MSDS Internet: www.petro-canada.ca/msds Western Canada, Ontario & Central Canada, telephone: 1-800-668-0220; fax: 1-800-837-1228 Quebec & Eastern Canada, telephone: 514-640-8306; fax: 514-640-8385 For Product Safety Information: (905) 804-4752		Prepared by Product Safety - JOW on 2/8/2004. Data entry by Product Safety - JOW.
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)
	A, B-1		

Section 1. Chemical Product and Company Identification

Product Name	PROPANE	Code	W222 SAP: 169
Synonym	Propane HD-5, Propane commercial, Liquefied Petroleum Gas (LPG), C3H8, CGSB Propane Grade 1, CGSB Propane Grade 2, odorized propane, stench propane, automotive propane.	Validated on	3/17/2004.
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	In case of Emergency	Petro-Canada: 403-298-3000 Canadac Transportation: 613-908-6686 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	Propane is used as a fuel gas, refrigerant, automotive fuel and as a raw material for organic synthesis. The grade determines the propane content. It is supplied as pressurized liquid in tanks.		

Section 2. Composition and Information on Ingredients

		Exposure Limits (ACGIH)			
Name	CAS #	% (V/V)	TLV-TWA (h)	STEL	CEILING
HD-5 Propane					
Propane	74-98-6	>80	1000 ppm	Not established	Not established
Propane	115-07-1	<5	Simple Asphyxiant	Not established	Not established
Commercial Propane					
Propane	74-98-6	>75	1000 ppm	Not established	Not established
Propane	115-07-1	<20	Simple Asphyxiant	Not established	Not established
Both grades may contain:					
Ethane	74-84-0	<6	1000 ppm	Not established	Not established
Butane +	106-97-8	<5	1000 ppm	Not established	Not established
Manufacturer	Not applicable				
Recommendation					
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.				

Section 3. Hazards Identification

Potential Health Effects	The product is contained under pressure. Do not puncture, incinerate or heat container as contents may explode. Flammable gas. Exercise caution when handling this material. Propane may displace oxygen and cause asphyxiation. Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure, coma and death. Contact with gas or liquefied gas may cause burns and frostbite to eyes and skin. Ingestion is not an expected route of exposure. 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. 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	Ingestion is not an applicable route of exposure for gases.
Note to Physician	Not available

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Section 5. Fire-fighting Measures			
Flammability	Class I - flammable gas (NFPA).	Flammable Limits	Lower: 2.1%; Upper: 8.5%, (NFPA).
Flash Points	CLOSED CUP: -104°C (-155°F).	Auto-ignition Temperature	450°C (842°F), (NFPA).
Fire Hazards In Presence of Various Substances	Extremely flammable in presence of open flames, sparks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. Rapid escape of vapours may generate static charge causing ignition. May accumulate in confined spaces.	Explosion Hazards In Presence of Various Substances	Do not cut, weld, heat, drill or pressurize empty container. Containers may explode in heat of fire. Vapour explosion hazard indoors, outdoors or in sewers. Propane may form explosive mixtures with air.
Products of Combustion	Carbon oxides (CO, CO ₂), acid smoke and irritating vapours as products of incomplete combustion.		
Fire Fighting Media and Instructions	NAERG2000, GUIDE 115, Flammable Gas: CAUTION: This product has a low flash point, use of water spray when fighting fire may be inefficient. SMALL FIRE: Use DRY chemicals, CO ₂ , water spray or foam. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet. 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. DO NOT extinguish a leaking gas flame unless leak can be stopped. 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. Self-contained breathing apparatus (SCBA) will be required if approaching the fire from downwind, or to enter enclosed areas or buildings. Handle damaged cylinders with extreme care.		
Section 6. Accidental Release Measures			
Material Release or Spill	IN THE EVENT OF A LARGE SPILL CONSIDER THE FOLLOWING CONTROL MEASURES: Consult current National Emergency Response Guide Book (NAERG) for appropriate spill measures if necessary. Evacuate non-essential personnel. Extinguish all ignition sources. Stop leak if safe to do so. Ventilate area. Ensure clean-up personnel wear appropriate personal protective equipment. Avoid breathing vapours of material. Notify appropriate authorities immediately.		
Section 7. Handling and Storage			
Handling	EXTREMELY FLAMMABLE GAS. Handle with care. Avoid contact with any sources of ignition, flames, heat, and sparks. Ensure all equipment is grounded/bonded. Avoid confined spaces and areas with poor ventilation. Avoid skin contact. Avoid eye contact. Avoid inhalation of product vapours. Wear proper personal protective equipment (See Section 8). Rapid escape of vapour may generate static charge causing ignition. Use spark-proof electrical equipment. Do not allow escaping compressed gas or liquid to come in contact with skin or eyes as it can cause frostbite. SPECIAL PRECAUTIONS: Sludges and tank scale from propane storage tanks, trucks and rail cars, and filters/screens may contain naturally occurring radioactive material ("NORM") in the form of lead 210. Similarly, equipment used for the transfer of propane such as product pipelines, pumps and compressors, may have detectable levels of radioactive lead 210 on inner surfaces. Workers involved in cleaning, repair or other maintenance on inner surfaces of such equipment should avoid breathing dust generated from such activities. Suitable codes of practice should be developed for these activities, detailing appropriate occupational hygiene and disposal practices.		
Storage	Store away from incompatible and reactive materials (See section 5 and 10). Store away from heat and sources of ignition. Store as flammable material. Compressed gases should be stored in a separate safety storage cabinet or room. Avoid direct sunlight. Keep container tightly closed. Store in dry, cool, well-ventilated area.		
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	- The selection of personal protective equipment varies, depending upon conditions of use.		
Eyes	Eye protection (i.e. safety glasses, safety goggles, and/or face shield) should be based on the condition of use. As a minimum, safety glasses with side shields should be worn when handling this material.		
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. Wear insulated gloves to prevent frostbite.		
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.		
Continued on Next Page		Internet: www.titane-uranium.ca/uk/uk.html	
		Available in French	

PROPANE

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Section 8. Physical and Chemical Properties			
Physical State and Appearance	Gas at room temperature; liquid when stored under pressure.	Viscosity	Not applicable.
Colour	Colourless.	Pour Point	Not applicable.
Odour	Propane is an odourless gas. Odourized propane will contain up to 28 g ethyl mercaptan per 1000 L of propane.	Softening Point	Not applicable.
Odour Threshold	Odour is not an adequate warning to prevent overexposure to propane. Prolonged exposure to mercaptans can cause olfactory desensitization.	Dropping Point	Not applicable.
Boiling Point	-42°C (-44°F)	Penetration	Not applicable.
Density	508 kg/m³ @ 15°C (59°F)	Oil / Water Dist. Coefficient	Not available
Vapour Density	1.56 (air=1)	Ionickty (in water)	Not available
Vapour Pressure	10763 mmHg (1435 kPa) @ 38°C (100°F)	Dispersion Properties	Not available
Volatility	Volatile	Solubility	Slightly soluble 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.	Decomposition Products	May release COx, acrid smoke and irritating vapours when heated to decomposition.

Section 11. Toxicological Information	
Routes of Entry	Inhalation, skin contact and eye contact.
Acute Lethality	Acute toxicity information is not available for the product as a whole, therefore, data for some of the ingredients is provided below. Propane (115-07-1): Acute inhalation toxicity (LC50): >50000 ppm/4h (rat). Butane (108-97-9): Acute inhalation toxicity (LC50): 202000 ppm/4h (mouse).
Chronic or Other Toxic Effects	
Dermal Route:	Contact with gas or liquefied gas may cause burns and frostbite to the skin.
Inhalation Route:	Propane may displace oxygen and cause asphyxiation. Inhalation of this product may cause respiratory tract irritation. Inhalation of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include: weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure, coma and death.
Oral Route:	Ingestion is not an applicable route of exposure for gases.
Eye Irritation/Inflammation:	Contact with gas or liquefied gas may cause burns and frostbite to the eyes.
Immunotoxicity:	Not available
Skin Sensitization:	Contact with this product is not expected to cause skin sensitization, based upon the available data and the known hazards of the components.
Respiratory Tract Sensitization:	Contact with this product is not expected to cause respiratory tract sensitization, based upon the available data and the known hazards of the components.
Mutagenic:	This product is not known to contain any components at >= 0.1% that have been shown to cause mutagenicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a mutagen.
Reproductive Toxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause reproductive toxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a reproductive toxin.

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Teratogenicity/Embryotoxicity:	This product is not known to contain any components at $\geq 0.1\%$ that have been shown to cause teratogenicity and/or embryotoxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a teratogen/embryotoxin.	
Carcinogenicity (ACGIH):	This product is not known to contain any chemicals at reportable quantities that are listed as Group 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):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by IRIS.	
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	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

TDG Classification	PROPANE, 2.1, UN1078 (CL-TDG)	Special Provisions for Transport	See Transportation of Dangerous Goods Regulations.
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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.				
	All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS).				
	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.	HCS (U.S.A.)	CLASS: Flammable gas. CLASS: Compressed gas. CLASS: Target organ effects.		
ADR (Europe) (Pictograms)	NOT EVALUATED FOR EUROPEAN TRANSPORT NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN	DOT (U.S.A.) (Pictograms)			
WHMIS (U.S.A.)	Health Hazard 1* Fire Hazard 4 Reactivity 0 Personal Protection H	NFPA (U.S.A.)		Rating	0 Insignificant 1 Slight 2 Moderate 3 High 4 Extreme

P&ID/ME

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Section 16. Other information**References**

Available upon request

* Marque de commerce de Petro-Canada - Trademark

Glossary

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/CGA B148.2 - Propane Installation Code
 CAS - Chemical Abstract Service
 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
 CNS - Central Nervous System
 COD5 - Chemical Oxygen Demand in 5 days
 CPR - Controlled Products Regulations
 DOT - Department of Transport
 DSCG - Dangerous Substances Classification and Labeling (Europe)
 DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)
 DSL - Domestic Substance List
 EEC/EEU - European Economic Community/European Union
 EINECS - European Inventory of Existing Commercial Chemical Substances
 EPA - Environmental Protection Agency
 EPCRA - Emergency Planning and Community Right to Know Act
 FDA - Food and Drug Administration
 FIFRA - Federal Insecticide, Fungicide and Rodenticide Act
 HCS - Hazard Communication Standard
 HMIS - Hazardous Material Information System
 IARC - International Agency for Research on Cancer

IRIS - Integrated Risk Information System
 LD50/LC50 - Lethal Dose/Concentration Kill 50%
 LDLo/LCLo - Lowest Published Lethal Dose/Concentration
 NAERG 99 - North American Emergency Response Guide Book (1996)
 NFPA - National Fire Prevention Association
 NIOSH - National Institute for Occupational Safety & Health
 NPLRI - National Pollutant Release Inventory
 NSNR - New Substances Notification Regulations (Canada)
 NTP - National Toxicology Program
 OSHA - Occupational Safety & Health Administration
 PEL - Permissible Exposure Limit
 RCRA - Resource Conservation and Recovery Act
 RTECS - Registry of Toxic Effects of Chemical Substances
 SARA - Superfund Amendments and Reorganization Act
 SD - Single Dose
 STEL - Short Term Exposure Limit (15 minutes)
 TDG - Transportation Dangerous Goods (Canada)
 TDLo/TCLo - Lowest Published Toxic Dose/Concentration
 TLM - 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

For Copy of MSDSInternet: www.petro-canada.ca/msds**Fuels & Solvents:**

Western Canada, Ontario & Central Canada, telephone: 1-800-688-0220; fax:

1-800-837-1228

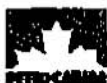
Quebec & Eastern Canada, telephone: 514-640-8308; fax: 514-640-8385

For Product Safety Information: (800) 804-4752

Prepared by Product Safety - JDN on 3/17/2004.

Data entry by Product Safety - DER.

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Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing	TDG (pictograms)
	D-2A, D-2B		

Section 1. Chemical Product and Company Identification

Product Name	PETRO-CANADA ANTIFREEZE	Code	W269
Synonym	Universal Antifreeze, Radiator Antifreeze, Diesel Antifreeze, Petro-Canada Antifreeze-Coolant, Petro-Canada Heavy Duty Antifreeze-Coolant, Pre-Mix Antifreeze, Petro-Canada Premium Radiator Antifreeze, Diesel Engine Coolant, Pre-Mixed Radiator Antifreeze/Coolant Petro-Canada.	Validated on	5/11/2006.
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	In case of Emergency	Petro-Canada: 403-286-3000 Canutec Transportation: 813-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	Used as an engine antifreeze coolant.		

Section 2. Composition and Information on Ingredients

Name	CAS #	% (W/W)	Exposure Limits (ACGIH)		
			TLV-TWA (8h)	STEL	CEILING
Ethylene glycol	107-21-1	≥45	Not established	Not established	100 mg/m ³ (aerosol)
Sodium tetraborate pentahydrate (Diesel Engine Coolant only)	12179-04-3	≤5	1 mg/m ³	Not established	Not established
Manufacturer Recommendation	Not applicable				
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.				

Section 3. Hazards Identification

Potential Health Effects	Contact with this product may cause eye irritation. Not expected to cause more than slight skin irritation. Inhalation of this product may cause respiratory tract irritation. Ingestion may be extremely hazardous. May cause teratogenicity/embryotoxicity. May cause damage to reproductive organs. For more information refer to Section 11 of this MSDS.
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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. 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: 3.2%, Upper: 15.3%
Flash Points	Closed Cup: 116°C (241°F) (Tagliabue) Open Cup: 116°C (241°F) (Cleveland)	Auto-ignition Temperature	413°C (775°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.

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Products of Combustion	Carbon oxides (CO, CO ₂), smoke and irritating vapours as products of incomplete combustion.
Fire Fighting Media and Instructions	NAERG2004, 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 ₂ . 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.

Section 6. Accidental Release Measures

Material Release or Spill	IN THE EVENT OF A LARGE SPILL CONSIDER THE FOLLOWING CONTROL MEASURES: Consult current National Emergency Response Guide Book (NAERG) 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. Ventilate area. Ensure clean-up personnel wear appropriate personal protective equipment. Avoid breathing vapours or mists of material. 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

Handling	Avoid contact with any sources of ignition, flames, heat, and sparks. Avoid confined spaces and areas with poor ventilation. Avoid skin contact. Avoid eye contact. Avoid inhalation of product vapours or mists. Do not ingest this product. Wear proper personal protective equipment (See Section 8). 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.
Storage	Store in dry, cool, well-ventilated area. Store away from heat and sources of ignition. Keep container tightly closed. Store away from incompatible and reactive materials (See section 5 and 10).

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	The selection of personal protective equipment varies, depending upon conditions of use.
Eyes	Chemical splash goggles should be worn when handling this material.
Body	If this material may come into contact with the body during handling and use, we recommend wearing appropriate protective clothing to prevent contact with the skin. (Contact your PPE provider for more information).
Respiratory	A minimum of NIOSH-approved air-purifying respirator with a organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.
Hands	If this material may come in contact with the hands during handling and use, we recommend wearing gloves of the following material(s): Neoprene, Polyvinyl chloride (PVC). Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section 9. Physical and Chemical Properties

Physical State and Clear viscous liquid.		Viscosity	Not available
Appearance			
Colour	Green.	Pour Point	Not available
Odour	Odourless.	Softening Point	Not applicable.
Odour Threshold	Not available	Dropping Point	Not applicable.
Boiling Point	129 to 197°C (264 to 387°F)	Penetration	Not applicable.
Density	1.07 to 1.145 (Water = 1)	Oil / Water Dist. Coefficient	Not available

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Internet: www.petro-canada.ca/products

Available in French

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Vapour Density	2.1 (Air=1)	Ionicity (In water)	Not available
Vapour Pressure	0.06 mmHg @ 20°C (68°F)	Dispersion Properties	Not available
Volatility	0% (w/w)	Solubility	Soluble in water, methanol and diethyl ether.

Section 10. Stability and Reactivity

Corrosivity	Not available		
Stability	The product is stable.	Hazardous Polymerization	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Reactive with oxidizing agents, acids, alkalis, perchloric acid, phosphorus and silvered copper wires carrying DC current.	Decomposition Products	May release COx, acrid smoke and irritating vapours when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation and ingestion.
Acute Lethality	Ethylene glycol (107-21-1): LD50: 4700 mg/kg (oral/rat). LD50: 9530 mg/kg (dermal/rabbit). Sodium tetraborate pentahydrate (12179-04-3): LD50: 3200-3500 mg/kg (oral/rat) (Boric acid). (Sodium tetraborate pentahydrate)
Chronic or Other Toxic Effects	
Dermal Route:	Short-term exposure is expected to cause only slight irritation, if any.
Inhalation Route:	Inhalation of this product may cause respiratory tract irritation.
Oral Route:	Extremely dangerous in case of ingestion.
Eye Irritation/Inflammation:	This product contains a component (at >= 1%) that can cause eye irritation. Therefore, this product is considered to be an eye irritant.
Immunotoxicity:	Not available
Skin Sensitization:	Contact with this product is not expected to cause skin sensitization, based upon the available data and the known hazards of the components.
Respiratory Tract Sensitization:	Contact with this product is not expected to cause respiratory tract sensitization, based upon the available data and the known hazards of the components.
Mutagenic:	This product is not known to contain any components at >= 0.1% that have been shown to cause mutagenicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a mutagen.
Reproductive Toxicity:	Borates are possible reproductive toxins based upon available animal ingestion studies in several species. These studies usually involved high doses, over prolonged periods of time. A human study following occupational exposure to borates by inhalation concluded that, no adverse effects to reproduction were found in this population, under the conditions of this study.
Teratogenicity/Embryotoxicity:	This product contains a component(s) at >= 0.1% that has been shown to cause teratogenicity and/or embryotoxicity in laboratory tests. Therefore, this product is considered to be a teratogen/embryotoxin (Ethylene glycol).
Carcinogenicity (ACGIH):	ACGIH A4: not classifiable as a human carcinogen (Ethylene glycol). This product is not known to contain any chemicals at reportable quantities that are listed as Group A1, A2, or A3 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):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by IRIS.
Carcinogenicity (OSHA):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by OSHA.
Other Considerations	The substance may be toxic to kidneys and liver. Repeated or prolonged exposure to the substance can produce target organ damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

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PETRO-CANADA ANTIFREEZE		Page Number: 4											
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 remarks.												
Section 13. Disposal Considerations													
Waste Disposal	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.												
Section 14. Transport Information													
TDG Classification	Not a hazardous material for transport according to the TDG Regulations. (Canada)	Special Provisions for Transport	Not applicable.										
Section 15. Regulatory Information													
Other Regulations	All of the components of this product are on the Domestic Substances List (DSL), are considered to be on the DSL, or are exempt from the New Substance Notification (NSN) requirements. 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.	HCS (U.S.A.)	CLASS: Target organ effects. CLASS: Irritating substance.										
ADR (Europe) (Pictograms)	NOT EVALUATED FOR EUROPEAN TRANSPORT NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN	DOT (U.S.A.) (Pictograms)											
HMS (U.S.A.)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Health Hazard</td> <td style="text-align: center; padding: 2px;">2</td> </tr> <tr> <td style="padding: 2px;">Fire Hazard</td> <td style="text-align: center; padding: 2px;">1</td> </tr> <tr> <td style="padding: 2px;">Reactivity</td> <td style="text-align: center; padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">Personal Protection</td> <td style="text-align: center; padding: 2px;">H</td> </tr> </table>	Health Hazard	2	Fire Hazard	1	Reactivity	0	Personal Protection	H	NFPA (U.S.A.)	<table style="width: 100%;"> <tr> <td style="width: 50%; text-align: center;">  </td> <td style="width: 50%;"> Rating: 0 Insignificant 1 Slight 2 Moderate 3 High 4 Extreme </td> </tr> </table>		Rating: 0 Insignificant 1 Slight 2 Moderate 3 High 4 Extreme
Health Hazard	2												
Fire Hazard	1												
Reactivity	0												
Personal Protection	H												
	Rating: 0 Insignificant 1 Slight 2 Moderate 3 High 4 Extreme												
Section 16. Other Information													
References	Available upon request. * Marque de commerce de Petro-Canada - Trademark												
Glossary ADGIH - 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/CGA B148.2 - 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 CNS - Central Nervous System COD5 - Chemical Oxygen Demand in 5 days CPR - Controlled Products Regulations DOT - Department of Transport DSDL - Dangerous Substances Classification and Labeling (Europe) DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe) DSL - Domestic Substances List EEC/EU - European Economic Community/European Union EINECS - European Inventory of Existing Commercial Chemical Substances IRIS - Integrated Risk Information System LD50/LC50 - Lethal Dose/Concentration (at 50%) LDLo/LCLo - Lowest Published Lethal Dose/Concentration NAERG/96 - North American Emergency Response Guide Book (1996) NFPA - National Fire Prevention Association NIOSH - National Institute for Occupational Safety & Health NPRI - National Pollutant Release Inventory NSNR - New Substances Notification Regulations (Canada) NTP - National Toxicology Program OSHA - Occupational Safety & Health Administration PEL - Permissible Exposure Limit RCRA - Resource Conservation and Recovery Act RTECS - Registry of Toxic Effects of Chemical Substances SARA - Superfund Amendments and Reorganization Act SD - Single Dose STEL - Short Term Exposure Limit (15 minutes) TDG - 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													
Continued on Next Page		Internet: www.petro-canada.ca/meds											
Available in French													

PETRO-CANADA ANTIFREEZE		Page Number: 5
EPA - Environmental Protection Agency EPCRA - Emergency Planning and Community Right to Know Act FDA - Food and Drug Administration FIFRA - Federal Insecticide, Fungicide and Rodenticide Act HCS - Hazard Communication Standard HMIS - Hazardous Material Information System IARC - International Agency for Research on Cancer		WHMIS - Workplace Hazardous Material Information System
For Copy of MSDS Internet: www.petro-canada.ca/msds Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837-1229 For Product Safety Information: (905) 804-4762		Prepared by Product Safety - JDN on 5/11/2004. Data entry by Product Safety - RS.
<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>		

Product #BACD



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MATERIAL SAFETY DATA SHEET**Sulphuric Acid****Section 01 - Chemical And Product And Company Information**

Product Identifier Battery Fluid Acid, Sulphuric Acid 36%

Product Use Used in manufacture of fertilizers, explosives, other acids, metal pickling and petroleum processing. Lead storage batteries.

Supplier Name ClearTech Industries Inc.
2303 Henselman Avenue
Saskatoon SK S7I 5Z3
Canada

Prepared By ClearTech Industries Inc. Technical Department
Phone: (306)684-2522

Preparation Date 08/31/2004

24-Hour Emergency Phone 306-684-2522

**Section 02 - Composition / Information on Ingredients**

Hazardous Ingredients Sulphuric Acid 36%
Water 64%

CAS Number Sulphuric Acid 7664-93-9
Water n/a

Synonym (s) Battery electrolyte, battery fluid, fertilizer acid, electrolyte acid, hydrogen sulfate, oil of vitriol, spirit of sulphur.

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Section 03 - Hazard Identification

Inhalation.....	Mists and vapours are corrosive and can cause severe irritation and damage to mouth, nose, lungs, and throat. Exposure symptoms are from coughing, sneezing, tickling sensations in nose and throat to laryngeal edema, bronchitis, and pulmonary edema. Prolonged exposure can result in erosion and discoloration of teeth, chronic irritation of the nose eyes throat and respiratory tract.
Skin Contact / Absorption.....	Severe irritation and burns to all human tissue. Repeated skin contact may cause dermatitis.
Eye Contact.....	Contact with even small amounts can result in severe damage (corneal burns and/or necrosis and conjunctivitis) which may result in sight loss. Dilute solution of sulphuric acid may produce temporary effects from which recovery is possible.
Ingestion.....	Severe irritation or burning of the mouth, throat, and stomach walls. May be fatal. Prolonged exposure can result in erosion and discoloration of teeth, chronic irritation of the nose eyes throat and respiratory tract.
Exposure Limits.....	ACGIH: 1mg/m^3 ; 3mg/m^3 NIOSH: TWA = 1mg/m^3 ; IDLH = 15mg/m^3 OSHA: TWA = 1mg/m^3

Section 04 - First Aid Measures

Inhalation.....	Remove victim to fresh air. Give artificial respiration only if breathing has stopped. If breathing is difficult, give oxygen. Seek immediate medical attention.
Skin Contact / Absorption.....	Remove contaminated clothing. Wash affected area with soap and water. Seek medical attention if irritation occurs or persists.
Eye Contact.....	Flush immediately with water for at least 20 minutes. Forcefully hold eyelids apart to ensure complete irrigation of eye tissue. Seek immediate medical attention.
Ingestion.....	Do not induce vomiting. If vomiting occurs, lean victim forward to prevent breathing in vomitus. Give large amounts of water. Do not give anything by mouth to an unconscious or convulsing person. Seek immediate medical attention.
Additional Information.....	Medical conditions that may be aggravated by exposure include asthma, bronchitis, emphysema, and other lung diseases, chronic nose, sinus or throat conditions. In the event of skin, eye contact, rapid and thorough flushing is essential.

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Section 05 - Fire Fighting

Conditions of Flammability.....	Non-flammable
Means of Extinction.....	Product does not burn. Do not add water to the acid. Use dry chemical to extinguish the surrounding fire.
Flash Point.....	Not applicable
Auto-ignition Temperature.....	Not applicable
Upper Flammable Limit	Not applicable
Lower Flammable Limit.....	Not applicable
Hazardous Combustible Products.....	Sulphur dioxide, sulphur trioxide, sulphuric acid fumes.
Special Fire Fighting Procedures....	Wear NIOSH-approved self-contained breathing apparatus and protective clothing.
Explosion Hazards.....	Evolution of explosive hydrogen gas on contact with most metals. May ignite combustible material. Not sensitive to mechanical impact or static discharge

Section 06 - Accidental Release Measures

Leak / Spill.....	Wear appropriate personal protective equipment. Ventilate area. Only enter area with PPE. Stop or reduce leak if safe to do so. Prevent material from entering sewers.
Deactivating Materials.....	Lime, limestone, sodium carbonate (soda ash), sodium bicarbonate, dilute sodium hydroxide.

Section 07 - Handling and Storage

Handling Procedures.....	Use proper equipment for lifting and transporting all containers. Use sensible industrial hygiene and housekeeping practices. Wash thoroughly after handling. Avoid all situations that could lead to harmful exposure.
Storage Requirements.....	Store in a cool, dry, well-ventilated place. Keep container tightly closed and away from incompatible materials.

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Section 08 - Personal Protection and Exposure Controls**Protective Equipment**

- Eyes**..... Chemical goggles, full-face shield, or a full-face respirator is to be worn at all times when product is handled. Contact lenses should not be worn; they may contribute to severe eye injury.
- Respiratory**..... Use NIOSH-approved respirator-full facepiece with cartridges (acid-gas and mists) or self-contained breathing apparatus.
- Gloves**..... Impervious gloves of chemically resistant material (rubber or PVC) should be worn at all times. Wash contaminated clothing with soap and water, dry thoroughly before reuse.
- Clothing**..... Body suits, aprons, and/or coveralls of chemical resistant material should be worn at all times. Wash contaminated clothing with soap and water, dry thoroughly before reuse.
- Footwear**..... Impervious boots of chemically resistant material should be worn at all times

Engineering Controls

- Ventilation Requirements**..... Mechanical ventilation (dilution or local exhaust), process or personnel enclosure, and control of process conditions. Supply sufficient replacement air to make up for air removed by exhaust systems.
- Other**..... Emergency shower and eyewash should be in close proximity.

Section 09 - Physical and Chemical Properties

- Physical State**..... Liquid
- Odor and Appearance**..... Clear colorless liquid. No odour.
- Odor Threshold**..... 1.0 mg/m³ measured as mist
- Specific Gravity (Water=1)**..... 1.285 at 26.7°C
- Vapor Pressure (mm Hg, 20°C)**..... <0.001Torr at 20°C
- Vapor Density (Air=1)**..... 3.4
- Evaporation Rate**..... Not available
- Boiling Point**..... 290°C

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Freeze/Melting Point..... 3°C (100%), -32°C (93%), -38°C (78%), -64°C (65%)

pH..... 1 N solution (5% w/w) = 0.3; 0.1 N solution (0.5% w/w) = 1.2; 0.01 N solution (0.05% w/w) = 2.1.

Water/Oil Distribution Coefficient.. Not available

Bulk Density..... Not applicable

% Volatiles by Volume..... Not available

Solubility in Water..... Miscible in water, liberates much heat

Molecular Formula..... H_2SO_4

Molecular Weight..... 98.08

Section 10 - Stability and Reactivity

Stability..... Stable under normal conditions.

Incompatibility..... Highly reactive with materials such as metals, metal oxides, hydroxides, nitrates, amines, carbonates, and other alkaline materials.

Hazardous Products of Decomposition Toxic fumes of oxides of sulfur when heated to decomposition. Will react with water or steam to produce toxic and corrosive fumes. Reacts with carbonates to generate carbon dioxide gas, and with cyanides and sulfides to form poisonous hydrogen cyanide and hydrogen sulfide respectively.

Polymerization..... Will not occur.

Section 11 - Toxicological Information

Irritancy..... Severe Irritant. Skin and eye irritant.

Sensitization..... Not available

Chronic/Acute Effects..... Not available

Synergistic Materials..... Not available

Animal Toxicity Data..... LD50 (Oral, Rat)= 2140mg/kg
LC50 (Inhalation, Rat)= 510mg/m³

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Carcinogenicity..... IARC has classified "strong inorganic acid mists containing sulfuric acid" as a known human carcinogen, (IARC category 1). This classification applies only to mists containing sulfuric acid and not to sulfuric acid or sulfuric acid solutions.

Reproductive Toxicity..... Investigated as a reproductive effector

Teratogenicity..... Not available

Mutagenicity..... Investigated as a mutagen

Section 12 - Ecological Information

Fish Toxicity..... LC₅₀ Flounder (48 hr, aerated water) = 100 to 330mg/L. Conditions of bioassay not specified;
LC₅₀ Shrimp (48 hr, aerated water) = 80 to 90mg/L. Conditions of bioassay not specified;
LC₅₀ Prawn (48 hr, salt water) = 42.5ppm. Conditions of bioassay not specified.

This material may be toxic to aquatic life

Biodegradability..... Not available

Environmental Effects..... When released into the soil, this material may leach into groundwater. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition. When released into the air, this material may be removed from the atmosphere to a moderate extent by dry deposition

Section 13 - Disposal Consideration

Waste Disposal..... Dispose in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

Section 14 - Transportation Information

TDG Classification

Class..... 8

Group..... II

PIN Number..... UN 2795

Other..... Secure containers (full and/or empty) with suitable hold down devices during shipment.

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**Section 15 - Regulatory Information**

WHMIS Classification.....E, D2

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

Section 16 - Other Information

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

ClearTech Industries Inc. - Locations

Corporate Head Office: 2302 Henselman Avenue, Saskatoon, SK, S7L 5Z3

Phone: 306-664-2522

Fax: 306-665-6216

www.ClearTech.ca

Location	Address	Postal Code	Phone Number	Fax Number
Richmond BC	12431 Horsehoe way	V7A 4X6	604-272-4000	604-272-4598
Calgary AB	6616E - 40 th St. S.E.	T2C 2A1	403-279-1096	403-238-0889
Edmonton AB	11750 - 160 th Street	T5S 1N7	780-452-6000	780-452-4600
Saskatoon SK	2302 Henselman Avenue	S7L 5Z3	306-833-0177	306-833-3282
Regina SK	665 Henderson Drive	S4S 5X2	306-721-7737	306-721-8811
Winnipeg MB	340 Saulteaux Crescent	R3J 3T2	204-987-9777	204-987-9770
Mississauga ON	7480 Bath Road	L4T 1L2	905-612-0568	905-612-0575

24 Hour Emergency Number - All Locations - 306-664-2522