PROPANE

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

Synonym Propane HD-5, Propane commercial, Dimethylmethane, Propyl hydride, Liquefied Petroleum Gas (LPG), Alkane, C3H8

Supplier
ICG PROPANE
Suite 200, 19433 96th Avenue
Surrey, BC V4N 4C4

In case of emergency
ICG Propane Inc.
1-800-424-5807

Material Uses Propane is used as a fuel gas, refrigerant and as a raw material for organic synthesis. The grade determines the propane content. It is supplied as pressurized liquid in tanks and cylinders.

Section 2. Composition and Information on Ingredients

Name	CAS #	% (V/V)	Exposure Limits (ACGIH) TLV-TWA (8 h)	STEL	CEILING
Propane	74-98-6	>90	4508 mg / m3. (2500 PPM - 1988 Occupational Exposure Limits)	Not applicable	Not applicable
Propylene "/""	115-07-1	<5	Simple asphyxiant	Not applicable	Not applicable
Butane	106-97-8	<3	800 ppm	Not applicable	Not applicable
Ethane	74-84-0	0-5	Simple asphyxiant	Not applicable	Not applicable
Ethyl mercaptan	75-08-1	<50 ppm	0.5ppm	Not applicable	Not applicable

"Propane commercial contains more propylene
""Propylene may not be present

Supplier Recommendation Recommends a maximum exposure level of 2500 ppm (4508 mg/m3) for 8 hours time weighted average when handling propane based on 1986 ACGIH notice of intended change for propane. Consult local authorities for acceptable exposure limits.

Other Exposure Limits Consult local, provincial or territory authorities for acceptable exposure limits.

Section 3. Hazards Identification

Potential Health Effects The health effects caused by exposure to propane are much less serious than it's fire and explosion risk. Propane is essentially nontoxic in concentrations less than the lower explosive limit, but at very high concentrations it is a simple asphyxiant and displaces oxygen from the breathing atmosphere. Lack of oxygen may cause dizziness, headaches, diminished awareness, faulty judgement, increasing fatigue, impaired muscular coordination progressing to convulsions, coma and death. A person working around propane in an enclosed space or in close proximity to a propane source (filling cylinders, purging lines and lighting / adjusting pilot lights, etc.) who feels "light-headed", "dizzy", "drunken" or a little intoxicated should realize this effect may be due to a dangerously high level of propane vapours (in the explosive range) and go immediately into fresh air. Direct contact with escaping gas or liquefied gas can result in freezing burns or frost bite to skin and eyes. For more information, refer to Section 11.

Section 4. First Aid Measures

Eye Contact If the eye tissue is frozen, seek medical attention immediately; if tissue is not frozen, immediately and thoroughly flush the eyes with running water for at least 15 minutes, keeping eyelids open. If irritation, pain, swelling, or crying has occurred, get medical attention.

Skin Contact Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite (cold burns). If frostbite has occurred, do not rub the affected areas or flush them with water, but thaw frosted parts by soaking in water. In order to prevent further tissue damage, do not attempt to remove frozen clothing from frostbitten areas. If frostbite has not occurred, immediately and thoroughly wash contaminated skin with soap and water.

Inhalation Evacuate the victim to fresh air at once. If the victim is not breathing, perform mouth-to-mouth resuscitation. Administer oxygen if available. Keep the victim warm and at rest. Seek medical attention as soon as possible.

Ingestion Since the product is a gas and that it is mostly probable that it will be inhaled more than ingested, please consider to look first at the preventive measures in case of inhalation.

Note to Physician Monitor for respiratory distress. If cough or difficulty in breathing develops, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. Monitor blood gases to assure adequate ventilation. If vital signs become abnormal or symptoms develop obtain a chest x-ray.

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PROPANE

Section 5. Fire-fighting Measures

Flammability	Class I - flammable gas (NFPA).	Flammable Limits	LOWER: 2.4%, UPPER: 9.5%, (B149.2M95).
Flash Points	CLOSED CUP: -104.4°C (-156°F) (NFPA).	Auto-Ignition Temperature	493 - 549°C (920 - 1020°F). (B149.2M95).
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 vapour may generate static charge causing ignition.	Explosion Hazards in Presence of Various Substances	Can react vigorously with oxidizing materials. Severe explosion hazard when exposed to chlorine dioxide. Vapour explosion hazard indoors, outdoors or in sewers. Do not cut, weld, heat, drill or pressurize empty container.
Products of Combustion	Burns with a luminous, smoky flame. Carbon oxides (CO, CO_2), smoke and irritating fumes as products of incomplete combustion.		
Fire Fighting Media and Instructions	CAUTION This product has a low flash point. Use of water spray when fire may be inefficient. Cool containing vessels with water spray, do not use jet spray, in an effort to prevent pressure build up, auto ignition, or explosion. Small fire use dry chemical, CO_2, water spray or foam. Large fire, use water spray, fog, or foam. 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. Allow gas to burn if it cannot be shut off safely. If this is impossible, withdraw from area & let fire burn under controlled conditions. Withdraw immediately in case of rising sound from venting safety relief valve. For small outdoor fires, portable fire extinguishers may be used and Self Contained Breathing Apparatus 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. Handle damaged cylinders with extreme care.		

Section 6. Accidental Release Measures

Material Release or Spill	NAERG'96, GUIDE 115, Flammable Gas. ELIMINATE ALL IGNITION SOURCES. Ventilate closed spaces. Avoid contact. Stop leak if without risk. By forced ventilation, maintain concentration of gas below the range of explosive mixture. Remove the tank or cylinder to an open area. Leave to bleed off in the atmosphere. Use water spray to reduce vapours. Isolate area until gas has disappeared. Check with applicable jurisdiction for specific disposal requirements of spilled material and empty containers. Notify the appropriate authorities immediately.

Section 7. Handling and Storage

Handling	Keep away from heat, spark, open flames and other sources of ignition. Empty container may contain flammable/explosive residues or vapours. DO NOT reuse empty containers without commercial cleaning or reconditioning. Ground/bond line and equipment during pumping or transfer to avoid accumulation of static charge. Keep away from incompatibles such as oxidizing agents (peroxides, chlorine). Avoid inhalation of vapours and skin or eye contact with liquid. Practice good personal hygiene. Wash hands after handling and before eating. Launder work clothes frequently. Discard saturated leather goods SPECIAL PRECAUTIONS: Sludges and tank scale from propane storage tanks, trucks, 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	Transport and store cylinders and tanks secured in an upright position in a ventilated space. Cylinders that are not in use must have the valves in closed position and be equipped with a protective cap or collar. Do not store with oxidizing agents, oxygen or chlorine cylinders. Transport, handle and store according to applicable Federal and Provincial regulations (i.e. CAN/CGA B149.2 Propane Installation Code and TDG regulations.)

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal outdoor application, special ventilation is not necessary. For indoor or confined spaces, provide explosion-proof local exhaust ventilation (as per the CAN/CGA B149.2 Propane Installation Code), adequate oxygen (at least 18% by volume), and flame-proof electrical switches and lighting system. Make-up air should always be supplied to balance air removed by exhaust ventilation.
Personal Protection	
Eyes	Face shield, safety glasses or chemical splash goggles in case of splashing.
Body	Wear appropriate loose clothing with closed neck and long sleeves to prevent the skin from becoming frozen from contact with the liquid or from contact with vessels containing the liquid.
Respiratory	When exposure is likely to exceed recommended exposure limit (see section #2), use NIOSH approved respirator. Respirator should be selected based on the form and concentration of containment in air (refer to NIOSH Pocket Guide for Chemical Hazard for respirator selection). In order to determine the concentration of the containment, air sampling is recommended and should be performed by a health and safety specialist (as per the NIOSH Manual of analytical methods for method of measurement). If air sampling is not practical and concentration is unknown, use SCBA.
Hands	Wear insulated gloves to prevent frostbite.
Feet	Safety boots or shoes.

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Section 9. Physical and Chemical Properties

Physical State & Appearance	Gas at room temperature; liquid when stored under pressure.	**Viscosity**	Not applicable.
Colour	Colourless.	**Pour Point**	Not applicable.
Odour	Odourless gas in natural state at any concentration. Propane sold for fuel purposes under pressure usually has an odourant added to it. This odourant is usually a mercaptan, which has an odour similar to "rotten eggs" or "skunk". The odourant level is such that it is noticeable below the Lower Exposure Limit (LEL) of the propane. WARNING: Studies have shown that not all persons are sensitive to the skunky smell and may not be able to detect this warning device!	**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	0.51 Kg/L @15°C (Water = 1).	**Oil/Water Dist. Coeff**	Log Kow: 2.36; mobile.
Vapour Density	1.56 @ 0°C (32°F), 1.8 @ 20°C (68°F) Air = 1.	**Ionicity (in water)**	Not applicable.
Vapour Pressure	<10763 mmHg @ 100°F (<1435 kPa @ 38°C).	**Dispersion Properties**	Not available.
Volatility	Volatile.	**Solubility**	62ppm in water at 25°C (77°F), slightly soluble in acetone. Soluble in benzene, ether, alcohols, chloroform.

Section 10. Stability and Reactivity

Corrosivity	Non corrosive.		
Stability	The product is stable under normal handling and storage conditions.	**Hazardous Polymerization**	Will not occur under normal conditions.
Incompatible Substances/ Conditions to Avoid	Highly reactive with oxidizing agents (peroxides, chlorine).	**Decomposition Products**	Releases of Co, smoke and irritating fumes when heated to decomposition

Section 11. Toxicological Information

Routes of Entry	Inhalation, skin contact and eye contact.
Acute Lethality	Simple asphyxiant. LC50 (inhalation/human): no effect for 10,000 ppm (1%) break exposure; slight dizziness in a few minutes at 100,000 ppm (10%).

Chronic or Other Toxic Effects

Dermal Route:	Low dermal penetration. Skin irritation has not been shown even with twice daily application for 12 weeks in human volunteers.
Inhalation Route:	Subchronic inhalation studies in monkeys show no evidence of organs toxicity or abnormalities.
Oral Route:	No studies were found.
Eye Irritation/Inflammation:	None.
Immunotoxicity:	No studies were found.
Skin Sensitization:	No studies were found.
Respiratory Tract Sensitization:	No studies were found.
Mutagenic:	Not mutagenic in the Salmonella typhimurium/microsome assay (Ames test).
Reproductive Toxicity:	No studies were found.
Teratogenicity/Embryotoxicity:	No studies were found.
Carcinogenicity (ACGIH):	Simple asphyxiant.
Carcinogenicity (IARC):	No studies were found.
Carcinogenicity (NTP):	No studies were found.
Carcinogenicity (IRIS):	No studies were found.
Carcinogenicity (OSHA):	No studies were found.

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Other Considerations	Acts as a simple asphyxiant – inert gas or vapour. The narcotic or intoxicated effect of a simple asphyxiant may impair a person's judgement, but it is temporary and will rapidly disappear in fresh air. Persons with anemia or other conditions of reduced oxygen-carrying capacity may be more sensitive. Propane producers and distributors may, from time to time, add small amounts of methanol to the propane to overcome water and freezing problems. Methanol may accumulate in liquid residues in propane piping and storage vessels. Please refer to a methanol Material Safety Data Sheet (MSDS) for further details concerning methanol.

Section 12. Ecological Information

Environmental Fate	Volatilizes and disperses rapidly. Volatilization is expected to be the dominant fate process.	Persistence/ Bioaccumulation Potential	Propane is readily biodegraded by soil bacteria (Microbacterium vaccae). The degradation of propane is similar to the degradation of fatty acids.
BOD5 & COD	Not available.	Products of Biodegradation	Not available.
Additional Remarks	Henry's Law constants for propane has been calculated to be 7.07x10-1 atm-m³/mole @ 25°C. These mean that propane may rapidly volatilize from water and moist soil to the atmosphere. The estimated half-life for evaporation of propane from a model river (1m deep flowing 1m/s with a wind speed of 3 m/s) and a model pond are 1.9 hrs. and 2.3 hrs., respectively.		

Section 13. Disposal Considerations

Waste Disposal	Preferred waste management priorities are: (1) incineration with energy recovery; (2) evaporation; (3) disposal at licensed waste disposal facility. Ensure that disposal or reprocessing is in compliance with government requirements and local disposal regulations.

Section 14. Transport Information

TDG Classification	Shipping name: Propane or Liquefied Petroleum Gas; UN1978 or UN 1075, Class 2.1; Label required: Flammable Gas.	Special Provisions for Transport	102 Add "SPECIAL COMMODITY" to document if in car load, container load by rail. Acceptable modes of transportation: air (cargo only), rail, road and water. Not acceptable for transport by passenger aircraft.

Section 15. Regulatory Information

Other Regulations	All components of this formulation are listed in the Domestic Substances List (DSL-Canadian) and in the Toxic Substances Control Act Inventory (TSCA-U.S.). This product is not known to contain any of the carcinogens required to be listed under OSHA hazard communication standard, 29 CFR 1910.1200 (U.S.). Not listed in EPCRA or SARA Title III, Section 313, Toxic Chemicals (40 CFR 355). Not listed in CERCLA (40 CFR 302.40). Please note that the chemical identity of some or all of the ingredients that may be listed herein is confidential business information and is being withheld as permitted by 29 CFR 1910.1200 and various State Right to Know Laws.
DSD/DPD (Europe)	2- Risk of explosion by shock, friction, fire or other sources of ignition. 13- Extremely flammable liquefied gas. 16- Explosive when mixed with oxidizing substances. 20/21- Harmful by inhalation and in contact with skin. 35- Causes severe burns.
DOT (U.S.A.) (Pictograms)	

HMIS (U.S.A.)		NFPA (U.S.A.)	Rating
Health Hazard	1		0 Insignificant
Fire Hazard	4		1 Slight
Reactivity	0		2 Moderate
Personal Protection	d		3 High
			4 Extreme

Section 16. Other Information

References	Available upon request.

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists
ASTM - American Society for Testing and Materials
BOD5 - Biological Oxygen Demand in 5 days
CAN/CGA 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 - Chemical Hazard Information and Packaging Approved Supply List
COD - Chemical Oxygen Demand
CPR - Controlled Products Regulation
DOT - Department of Transportation
DSCL - Dangerous Substances Classification and Labeling (Europe)
DSD/DPD - Dangerous Substance 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
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 Prevention Association

Continued on Next Page

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NIOSH - National Institute for Occupational Safety & Health	TDG - Transportation Dangerous Goods (Canada)
NPRI - National Pollutant Release Inventory	TDLo/TCLo - Lowest Published Toxic Dose/Concentration
NTP - National Toxicology Program	TLV-TWA - Threshold Limit Value - Time Weighted Average
OSHA - Occupational Safety & Health Administration	TSCA - Toxic Substances Control Act
PEL - Permissible Exposure Limit	USEPA - United States Environmental Protection Agency
RCRA - Resource Conservation and Recovery Act	USP - United States Pharmacopoeia
SARA - Superfund Amendments and Reorganization Act	WHMIS- Workplace Hazardous Material Information System
SD - Single Dose	
STEL - Short Term Exposure Limit (15 minutes)	

Information Contact ICG Propane Inc. 1-800-424-8807	Prepared by: Williams 99/12/09 Data entry by: Data Business Forms

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.

APPENDIX "H"

♦ Drill Muds

Serving the Drilling Industry

WESTCOAST DRILLING SUPPLIES LTD.

#6 - 2351 SIMPSON ROAD
RICHMOND, B.C. V6X 2R2
TEL: (604) 278-4954
FAX (604) 278-4914

EMERGENCY PHONE NO. (604) 278-4954

MATERIAL SAFETY DATA SHEET

SECTION I: IDENTIFICATION OF PRODUCT

PRODUCT NAME: X-TRA GEL

CHEMICAL FAMILY: Sodium Montmorillonite

WHMIS CLASSIFICATION: Class D-2(A)

WORK PLACE HAZARD: Potential Carcinogen; contains free silica

TRANSPORTATION OF DANGEROUS GOODS (TDGR)

CLASSIFICATION: Not Dangerous Goods

PACKAGE GROUP: Not Applicable

PRODUCT IDENTIFICATION NUMBER (PIN): Not Applicable

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT	PERCENTAGE	CAS NUMBER	OSAH PEL	ACGIH TLV
Bentonite		1302-78-9	5 mg/M	Not Applicable
Quartz (Silica)		14808-60-7	10 mg/M	0.1 mg/M
Cyrstobalite		14464-46-1	10 mg/M	0.05 mg/M
Tridymite		15468-32-3	10 mg/M	0.05 mg/M

SECTION III: TOXICOLOGICAL PROPERTIES

ROUTE OF ENTRY:
[ ] skin, [ ] eye contact, [xxx]inhalation, [ ] ingestion

ACUTE - SHORT TERM EXPOSURE: Cough if exposed to dust at levels higher than TLV's.

CHRONIC - LONG TERM EXPOSURE: May lead to development of silicosis or other respiratory problems if consistently exposed to free silica containing airborne bentonite.

SECTION IV: FIRST AID MEASURES

No first aid measures are suggested for Chronic (long term exposure). For acute (short term exposure) remove patient from dusty environment.

SECTION V: PHYSICAL DATA

APPEARANCE AND ODOUR:	Pale grey to buff powder or granules; odourless
DENSITY (SPECIFIC GRAVITY):	2.35
BOILING POINT:	Not Applicable
MELTING POINT:	788°C
WATER SOLUBILITY:	Insoluble; forms colloidal suspension
% VOLATILE BY VOLUME:	Not Applicable
EVAPORATION RATE:	Not Applicable
VAPOUR PRESSURE: (MM Hg)	Not Applicable
VAPOUR DENSITY: (Air = 1)	Not Applicable
Ph:	7 - 6

SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: Not Applicable FLAMMABLE LIMIT: Not Applicable

EXTINGUISHING MEDIA: Not Applicable

SPECIAL FIRE FIGHTING PROCEDURES: Not Applicable

UNUSUAL FIRE AND EXPLOSION HAZARDS: Not Applicable

SECTION VII: REACTIVITY DATA

STABLE [XXX] INSTABLE: [ ]

INCOMPATIBILITY (CONDITIONS TO AVOID): None

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS POLYMERIZATION: Will not occur [xxx] May occur [ ]

SECTION VIII: PREVENTATIVE MEASURES

RESPIRATORY PROTECTION: NIOSH/MSHA approved respirators for silica bearing dust.

VENTILATION: Yes if particular; Personal air supply may be useful.

PROTECTIVE GLOVES: None required.

EYE PROTECTION: Suggest goggles.

OTHER PROTECTIVE EQUIPMENT: None required.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Avoid breathing dust; wear an approved respirator. Practice reasonable caution and personal cleanliness. Avoid eye contact.

STEPS TO BE TAKEN IN CASE OF SPILL OR LEAK

Vacuum or sweep up if dry. Avoid flushing with water as material may become extremely slippery.

WASTE DISPOSAL METHOD

Dispose of material in a manner to prevent generating dust.

SECTION IX: PREPARATION

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

Date issued: November 10, 1988
Date Revised: March 1, 1992

By: Product Safety Committee

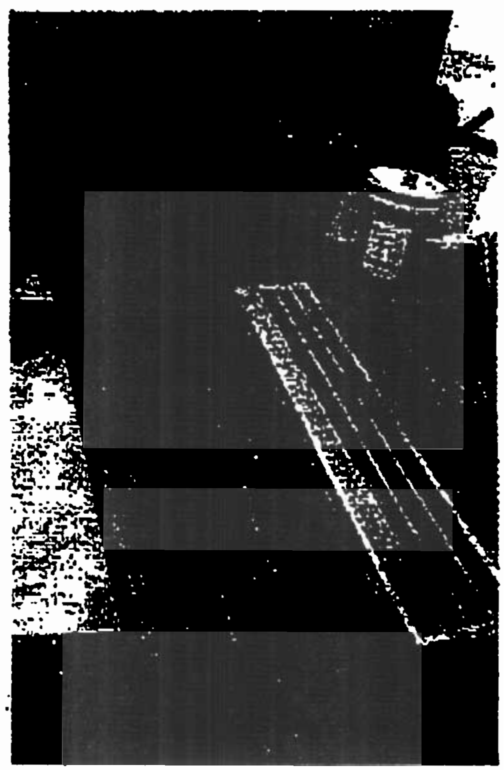
Post-it™ Fax Note / Feuillets de transmission par télécopieur
To/A: DAVE SKELTON
From/De: KELLY WHIPPLE
Co./Dept. / Cie/Service
Co. / Cie
Phone # / N° de tél.
Phone # / N° de tél.
Fax # / N° de télécopieur
Fax # / N° de télécopieur

POLY-DRILL O.B.X. AND 133X

Overburden and Core Drilling Fluid System

Poly-Drill O.B.X. & 133X are a second generation polymer drilling system that overcomes the shearing problems of emulsion polymers such as Easy Mud, 120L and Matex 1200. They act as cross-linked liquid viscosifiers used for cutting removal in drilling applications.

- Non-shearing clay stabilizing and core recovery system that maintains viscosity under shear.
- Includes a lubricate that reduces rod vibration and improves tube filling in broken ground.
- Maintains hole stability and hole cleaning for overburden as well as sand seams.
- Films metal surfaces to provide excellent lubrication of down hole equipment, water swivels, pressure pumps and mixing equipment.
- Assists in bore hole stabilization.
- Helps alleviate solids accumulation within drilling fluids by aiding an Enviro-Pak filtration system.
- Safe for the environment.



- Mix 1 quart of O.B.X. per 150 gallons of water while mixing tank is filling for over burden and sand, when tank is near full, then add equal amount of 133X.
- Greater viscosity can be achieved by increasing each product.
- The O.B.X. must be added to the mixing tank first.
- This cross-linked system can achieve a funnel viscosity of 45 to 50 seconds.

*Packaged in 5 gallon plastic pails (20 Liters).

POLY-DRILL CLAY TREAT II

Poly-Drill Drilling Systems

Poly-Drill Clay Treat II is a specialized product designed specifically for use as a replacement for bagged potassium chloride(KcL). Clay Treat II does not contain potassium, but is composed of a sophisticated mildly cationic complex that functions much like KcL to control shale and clay activity. A 2% KcL solution contains 9,700 ppm of chloride ions, while the equivalent of Clay Treat II contains only 165 ppm of chloride ions. This significantly reduces chloride concentration and greatly lessens the environmental risks associated with the use of KcL fluids.

* Provides excellent shale and clay control without the mixing problems associated with large volumes of bagged KcL.

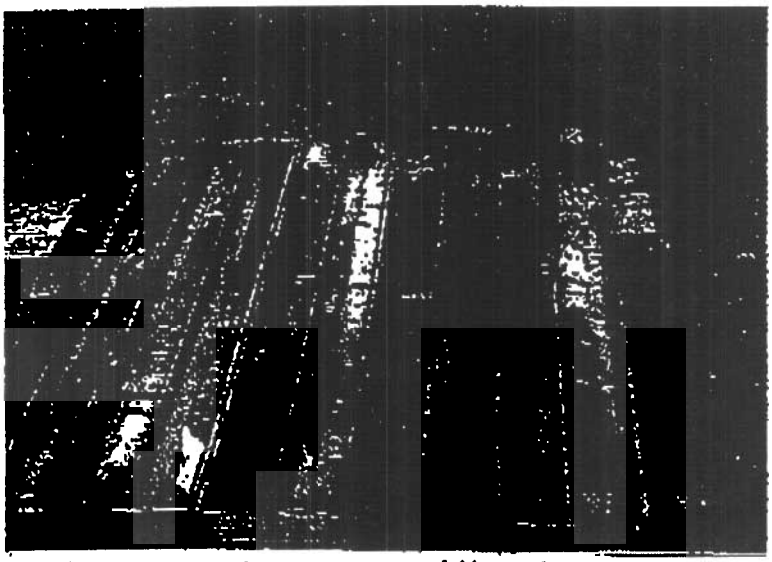
* Compatible with all polymer systems and cross-linked gels such as Poly-Drill 1330, 133X, O.B.X., and maybe used in water, brine or acid systems.

* Will not affect pH and being a non-surface active it does not adversely affect formation.

* Can be easily utilized in "on the fly systems" to eliminate pre-mixing and leftover brine disposal problems.

* Highly effective in preventing wellbore shale erosion.

* Typically applied at a concentration of 0.5 to 10 gallons per 1,000 gallons of fluid(GPT) depending on the percent of KcL being replaced, where 2 % potassium chloride functional equivalent is desired, Clay Treat II is added to fresh water at a concentration of 2 gallons per 1,000 gallons of water.



Clay Treat II has been very successful in continuous coring of kimberlite diamond samples, uranium deposits and fault seams

Poly-Drill Drilling Systems
1824 - 104 Avenue, S.W.
Calgary, Alberta, Canada
T2W-0A8
(403) 259-5112 FAX (403) 255-7185

MATERIAL SAFETY DATA SHEET

Section 1—PRODUCT IDENTIFICATION

PRODUCT TRADE NAME(S): Poly Drill 133X/1330

PRODUCT DESCRIPTION: Latex polyelectrolyte

SECTION 2—COMPOSITION

A liquid polymer. Evaluation of the ingredient(s) has found no ingredient(s) hazardous as per WHMIS regulations.

SECTION 3—PHYSICAL DATA

Boiling Point: Not available
Solubility in Water: Solubility limited by solution viscosity.
Density (g/ml): 1.08 at 25° C
Appearance and Odor: Blue. Odor slight.

Specific Gravity (@ 25 Deg.C.): 1.09
pH: 8.1 (1.0% solution)
Physical State: Liquid

SECTION 4—FIRE AND EXPLOSION DATA

Flash Point (method used): (PMCC) >100 C
Conditions of flammability: Intense heat, open flame.
Hazardous combustion products: Products of incomplete hydrocarbon combustion.
Upper and Lower flammable limits: Not available
Extinguishing media: Use water spray, foam, dry chemical, or carbon dioxide.

SECTION 5—REACTIVITY

Chemical stability: Stable under normal conditions.
Hazardous Polymerization: Will not occur
Incompatible substances: Avoid strong oxidizing and reducing agents.
Hazardous decomposition products: Carbon monoxide, carbon dioxide, and products of incomplete hydrocarbon combustion.

SECTION 6—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: If misted, no effects of exposure are expected.
Exposure limits: TLV-TWA: Mineral oil, mist 5 mg/m3
Carcinogenicity: None of the components of this product are listed as carcinogens by IARC and ACGIH
Sensitization of product: Not suspected to be a sensitizer.
Teratongenicity: Not available.
Mutagenicity: Not available.

SECTION 7—EMERGENCY AND FIRST AID PROCEDURES

SKIN: Wash exposed area with soap and water. If irritation or abnormalities persist, call a physician.
EYE: Immediately flush eyes with water for 15 minutes, if irritation or abnormalities persist, call a physician.
INHALATION: Remove to fresh air. If breathing becomes difficult, give oxygen and call a physician.
INGESTION: Don not induce vomiting: Call a physician immediately.

SECTION 8—HANDLING AND USE PRECTIONS

Storage requirements: keep container closed when no 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.

SECTION 9—INDUSTRIAL HYGIENE CONTROL MEASURES

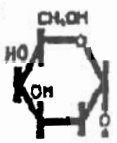
Respiratory Protection: None normally required.
Ventilation: If mist and/or vapors are present, use air purifying respirator of self-contained breathing apparams, but this is rarely required.
Eye Protection: Safety glasses, if personally preferred
Gloves: Generally not necessary. Personal preference.

SECTION 10—TOXICOLOGICAL PROPERTIES

Environmental Effects: Not known to be harmful to aquatic life at low concentrations.
Freshwater aquatic toxicity rating: 96 hour LC50 Rainbow Trout = 160 mg/L
96 hour LC50 Salmon = 160 mg/L

SECTION 11—DEPARTMENT OF TRANSPORTATION INFORMATION

Shipping Name: Drilling Mud
Hazard Class: Not hazardous
Hazardous Substances: None
Cautionary Labeling: None required



Poly-Drill Drilling Systems
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MATERIAL SAFETY DATA SHEET

Section 1—PRODUCT IDENTIFICATION

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

SECTION 2—COMPOSITION

A liquid polymer: Evaluation of the ingredient(s) has found no ingredient(s) hazardous as per WHMIS regulations.

SECTION 3—PHYSICAL DATA

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

SECTION 4—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

SECTION 5—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 hypochloride.
Hazardous decomposition products: None known

SECTION 6—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.
Teratongenicity: Not available.
Mutagenicity: Not available.
Carcinogenicity: None of the components of this product are listed as carcinogens by IARC and ACGIH

SECTION 7—EMERGENCY AND FIRST AID PROCEDURES

SKIN: Wash exposed area with soap and water. If irritation or abnormalities persist, call a physician.
EYE: Immediately flush eyes with water for 15 minutes, if irritation or abnormalities persist, call a physician.
INHALATION: Remove to fresh air. If breathing becomes difficult, give oxygen and call a physician.
INGESTION: Don not induce vomiting: Call a physician immediately.

SECTION 8—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.

SECTION 9—INDUSTRIAL HYGIENE CONTROL MEASURES

Respiratory Protection: None normally required.
Ventilation: If mist and/or vapors are present, use air purifying respirator of self-contained breathing apparatus, but this is rarely required.
Eye Protection: Safety glasses, if personally preferred
Gloves: Generally not necessary. Personal preference.

SECTION 10—TOXICOLOGICAL PROPERTIES

Environmental Effects: Not known to be harmful to aquatic life at low concentrations.
Freshwater aquatic toxicity rating: 96 hour LC50 Rainbow Trout = 160 mg/L
96 hour LC50 Salmon = 160 mg/L

SECTION 11—DEPARTMENT OF TRANSPORTATION INFORMATION

Shipping Name: Drilling Mud
Hazard Class: Not hazardous
Hazardous Substances: None
Cautionary Labeling: None required

Poly Drill Drilling Systems
1824 - 104 Avenue, S.W.
Calgary, Alberta, Canada
T2W-0A8
(403) 259-5112 FAX (403) 255-7185

Section 1—PRODUCT IDENTIFICATION

PRODUCT TRADE NAME(S): **Poly Drill CLAY TREAT II**

SECTION 2—COMPOSITION

SECTION 3—PHYSICAL DATA

Boiling Point: 100 C
Solubility in Water: Soluble
Density (g/ml): 1.1
Appearance and Odor: Red. Characteristic slight odor.

Specific Gravity (@ 25 Deg.C.): 1.09
pH: 5.0 - 7.0 (1.0% solution)
Physical State: Liquid

SECTION 4—FIRE AND EXPLOSION DATA

Flash Point: >93.3 C
Conditions of flammability: Will burn after drying
Hazardous combustion products: Oxides of carbon and nitrogen and products of incomplete combustion.
Upper and Lower flammable limits: Not available
Extinguishing media: Use water spray, foam, dry chemical, or carbon dioxide.

SECTION 5—REACTIVITY

Chemical stability: Stable under normal conditions.
Hazardous Polymerization: Will not occur.
Incompatible substances: Avoid strong oxidizing and reducing agents.
Hazardous decomposition products: Not available.

SECTION 6—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: If misted, no effects of exposure are expected.
Exposure limits: Contains trace acrylamide (SKIN). Exposure limit, TWAEV=0.03 mg/m(ONT. Reg. 654/86).
Contains traces of isopropanol. Exposure limit, TWAEV=400ppm, STEV=500ppm(ONT. Reg. 654/86).
Carcinogenicity: This product contains traces of acrylamide. Acrylamide is listed by IARC(Group 2B) and ACGIH(Group A2) as a possible human carcinogen.
Teratongenicity: Not available.
Mutagenicity: Not available.

SECTION 7—EMERGENCY AND FIRST AID PROCEDURES

SKIN: Wash exposed area with soap and water. If irritation or abnormalities persist, call a physician.
EYE: Immediately flush eyes with water for 15 minutes, if irritation or abnormalities persist, call a physician.
INHALATION: Remove to fresh air. If breathing becomes difficult, give oxygen and call a physician.
INGESTION: Don not induce vomiting: Call a physician immediately.

SECTION 8—HANDLING AND USE PRECTIONS

Storage requirements: keep container closed when no 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.

SECTION 9—INDUSTRIAL HYGIENE CONTROL MEASURES

Respiratory Protection: None normally required.
Ventilation: If mist and/or vapors are present, use air purifying respirator of self-contained breathing apparatus, but this is rarely required.
Eye Protection: Safety glasses, if personally preferred
Gloves: Generally not necessary. Personal preference.

SECTION 11—DEPARTMENT OF TRANSPORTATION INFORMATION

Shipping Name: Drilling Mud
Hazard Class: Not hazardous
Hazardous Substances: None
Cautionary Labeling: None required

Material Safety Data/Fiche signalétique

POLY-DRILL DRILLING
1824 - 104 AVENUE, S.W.
CALGARY, ALBERTA, CANADA T2W OA8
TEL. (403) 259-5112 FAX (403) 255-7185

EMERGENCY (403) 259-5112

I. PRODUCT IDENTIFICATION

Trade Name(s): Clay Treat II
WHMIS CLASSIFICATION: Non regulated
TDG Classification: Non dangerous goods TDG label N.R.
Manufacturer: Poly-Drill Drilling

II. PHYSICAL DATA

Boiling Point: 100 C
Solubility in Water: Soluble
Density(g/ml): 1.1
Appearance and Odor: Red with characteristically slight odor.

Specific Gravity(@25 Deg. C.): 1.1
pH: 5.0-7.0 (1.0% solution)
Physical state: Liquid

III. FIRE AND EXPLOSION DATA

Flash Point: >93.3 C
Conditions of flammability: Will burn after drying
Hazardous combustion products: Oxides of carbon and nitrogen and products of incomplete combustion.
Upper and Lower flammable limits: Not applicable
Extinguishing media: Use water spray, foam, dry chemical, or carbon dioxide.

IV. REACTIVITY

Stability: Stable under normal conditions
Hazardous Polymerization: Will not occur
Incompatible substances: Avoid strong oxidizing and reducing agents.
Hazardous decomposition products: Not available.

V. 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: If misted, no effects of exposure expected.
Exposure limits: Contains trace acrylamide (SKIN). Exposure limit, TWAEV=0.03mg/m(ONT. Reg. 654/86).
Contains traces of isopropanol. Exposure limit, TWAEV=400ppm, STEV=500ppm(ONT. Reg 654/86).
Carcinogenicity: Product contains traces of acrylamide. Acrylamide is listed by IARC(Group 2B) and ACGIH(Group A2) as a possible human carcinogen.

VI. EMERGENCY AND FIRST AID PROCEDURES

SKIN: Wash exposed area with soap and water. If irritation or abnormalities persist, call a physician.
EYE: Immediately flush eyes with water for 15 minutes, if irritation or abnormalities persist, call a physician.
INHALATION: Remove to fresh air. If breathing is difficult, give oxygen and call a physician.
INGESTION: Do not induce vomiting. Call a physician immediately.

VII. HANDLING AND USE PRECAUTIONS

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 is product is released or spilled. Clean spill areas thoroughly to avoid hazardous slippery conditions.

VII. INDUSTRIAL HYGIENE CONTROL MEASURES

Respiratory Protection: None normally required.
Ventilation: If mist and/or vapors are present, use air-purifying respirator of self-contained breathing apparatus, but rarely required.
Eye Protection: Safety glasses if personally preferred.
Gloves: Generally not necessary. Personal preference.

DEPARTMENT OF TRANSPORTATION INFORMATION

Shipping Name: Drilling Mud
Hazard Class: Not hazardous
Hazardous Substances: None
Cautionary Labeling: None required.

CLA/TREAT
PG#2