ALPHA CHEMICAL LIMITED
MATERIAL SAFETY DATA SHEET

MSDS # 1154-000

ETHYLENE GLYCOL

SECTION 1 – CHEMICAL PRODUCT and COMPANY INFORMATION

Product Name: Ethylene Glycol
Synonyms: Ethylene Glycol, 1,2-Ethanediol

Product Use: Antifreeze
WHMIS Classification: D2

ALPHA CHEMICAL LTD.
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Dartmouth, NS B3B 1T8
Date Prepared: March 7, 2003
Prepared By: Safety Department
Telephone: (902) 481-2532

EMERGENCY: (613) 996-6666 OR 1-800-981-2532

SECTION 2 – HAZARDS INGREDIENT(S)

Component	%	Cas Number	LC_{50}	LD_{50}
Ethylene Glycol	99.5%	107-21-1	10876 mg/kg (Inhl., rat)	4700 mg/kg (oral, rat)

*OSHA hazardous according to 29 CFR 1910.1200

SECTION 3 – PHYSICAL INFORMATION

Appearance	Clear, colorless liquid
Odor	Faint Odor
Physical State	Liquid
Specific Gravity (H_20=1)	1.115 (20/20)
Vapor Pressure (at 20 ^{0}C)	0.05 mmHg @ 20^0 C
Vapor Density (air =1)	2.14
Boiling Point	197^0 C (387^0 F)
Freezing Point	-13^0 C (9^0 F)
Solubility in water	Complete in water

SECTION 4 – FIRE OR EXPLOSION HAZARD

Flammable Material	
Flashpoint – Closed Cup	111^0 C (232^0 F)
Upper Explosive Limit	15.3 Vol. %
Lower Explosive Limit	3.2 Vol. %
Autoignition Temperature	400^0 C (752^0 F)

SECTION 4 (con't) – FIRE OR EXPLOSION HAZARD

Hazardous Products of Combustion
Compounds of carbon, hydrogen and oxygen, including carbon monoxide and other gases. The exact composition will depend on the conditions of combustion.

Extinguishing Media
Use of carbon dioxide or dry chemical for small fires; alcohol resistant aqueous foam or water spray for large fires.

Fire Fighting Instructions
If the potential exists for exposure to vapors or products of combustion, wear complete personal protective equipment, including self-contained breathing apparatus with full-face piece operated in positive pressure mode. Water spray can be used to reduce intensity of flames and to dilute spills to nonflammable mixtures. Use spray to cool fire-exposed structures and vessels.

CAUTION! Spraying with foam or water can cause frothing.

SECTION 5 – REACTIVITY INFORMATION

Chemical Stability
Stable and normally un-reactive.

Hazardous Polymerization
Will not occur.

Incompatibilities
Sulfuric acid and other dehydrating agents; nitric acid; oxygen, hydrogen peroxide, perchloric acid and other strong oxidizing agents; acetic anhydride; strong acids and bases at high temperatures; other materials reactive with hydroxyl compounds.

Hazardous Decomposition Products
Compounds of carbon, hydrogen and oxygen, including carbon monoxide and carbon dioxide. The exact composition will depend on the causes and conditions of decomposition.

Conditions to Avoid
Heat, sparks and open flame.

SECTION 6 - TOXICOLOGICAL PROPERTIES

POTENTIAL HEALTH EFFECTS

Effects of Single Acute Overexposure

Inhalation
Inhalation of mists or high concentrations of vapors (e.g. from hot operations) may cause upper respiratory tract irritation, headaches or nausea. May cause effects to the kidneys and central nervous system resulting in kidney failure and brain injury.

SECTION 6 TOXICOLOGICAL PROPERTIES con't

Eye Contact
Contact with liquid may cause slight eye irritation

Skin Contact
Contact with liquid may cause slight skin irritation. Prolonged or repeated contact may cause dermatitis.

Ingestion
Ingestion of large quantities may be harmful and in extreme poisoning may be fatal; causes central nervous system depression, cardiopulmonary effects and kidney and liver damage.

Chronic, Prolonged or Repeated Overexposure

Carcinogenic effects
Ethylene glycol is not considered a carcinogen.

Mutagenic
Ethylene glycol is not considered a mutagen.

Teratogenic
Ethylene glycol is considered to be an animal teratogen based on studies in which high levels were given in drinking water. Inhalation and dermal exposure have not produced significant tetotoxicity or malformations in animals. There is no current information to suggest that ethylene glycol produces birth defects in humans.

Target Organ Effects
Central nervous system, kidney, liver, fetus.

Medical Conditions Aggravated by Exposure
Exposure to this chemical may aggravate pre-existing skin and respiratory conditions.

SECTION 7 – PREVENTATIVE MEASURES

Engineering Controls
General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred, to keep airborne levels below recommended exposure limits.

Protective Equipment
A safety shower and eyewash should be readily available in close proximity to the work area.

Skin
Wear clothing and gloves to prevent repeated or prolonged contact. Gloves may be rubber, nitrile rubber, neoprene or polyvinyl chloride.

SECTION 7 – PREVENTATIVE MEASURES con't

Eyes

Wear safety glasses as a minimum eye protection.

Inhalation
Use a respirator approved by NIOSH/MSHA to maintain exposure below recommended limits.

Exposure Guidelines:

Ethylene Glycol (107-21-1)

OSHA PEL	ACGIH TLV
125 mg/m^3 (CEIL)	100 mg/m^3 (CEIL) None
50 PPM (CEIL)	39.4 PPM (CEIL) None

The ACGIH values are for ethylene glycol aerosol.

Storage Requirements
Keep all containers tightly closed when not in use. Store out of direct sunlight and on an impermeable floor. Use only UN approved containers.

Handling
Use with adequate ventilation. Keep containers closed when not in use. Always open containers slowly to allow any excess pressure to vent. Avoid breathing vapor or mist. Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Decontaminate soiled clothing thoroughly before reuse. Destroy contaminated leather clothing.

Small Spill and Leak
If spilled or released, eliminate ignition sources. Avoid eye or skin contact. Place leaking containers in well-ventilated area with spill containment. If fire potential exists, blanket spill with alcohol-type aqueous film-forming foam or use water spray to disperse vapors. Contain spill to facilitate cleanup. Cleanup methods may include absorbent materials, vacuum truck, etc. Avoid run-off into storm sewers and ditches, which lead to natural waterways.

WASTE INFORMATION

Disposal
All notification, cleanup and disposal should be carried out in accordance with federal, provincial and municipal regulations. Preferred methods of waste disposal are incineration or biological treatment in an approved facility.

SECTION 8 – FIRST AID MEASURES

Eyes
If eye contact occurs, flush with water for at least 15 minutes. If persistent irritation develops, get medical attention.

SECTION 8 – FIRST AID MEASURES con't

Skin
Wash with soap and water after handling material. If persistent irritation develops, get medical attention.

Inhalation
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion
Have victim drink several glasses of water then induce vomiting. Never give anything by mouth or induce vomiting to an unconscious person. Immediately seek medical attention.

NOTE TO PHYSICIAN
The principal toxic effects of ethylene glycol, when swallowed, are kidney damage and metabolic acidosis. Ethanol is antidotal and early administration may block the formation of toxic metabolites of ethylene glycol in the liver. Ethanol should be given intravenously, as a 5% solution in sodium bicarbonate, at a rate of about 10m 1/hr. A desired therapeutic level of ethanol in blood is 100mg/dl. Hemodialysis may be required. Pulmonary edema with hypoxemia has been described in a number of patients following poisoning with ethylene glycol. The mechanism has not been clucidated but it appears to be non-cardiogenic in origin in ventilation and positive end expiratory pressure may be applied. Correction of acidosis is essential.

SECTION 9 – TRANSPORT INFORMATION

TDG CLASSIFICATION Not Regulated

SECTION 10 – TOXICOLOGICAL INFORMATION

Oral Toxicity
Slightly toxic to humans by ingestion. The estimated average lethal dose for humans is 1.6g/kg by mouth.

Dermal LD5O
Essentially non-toxic to animals by skin absorption. The acute dermal LD5O in rabbits is 9.5g/kg.

Mutagenicity
No evidence of mutagenicity in bacteria, yeast or fungi.

SECTION 10 – TOXICOLOGICAL INFORMATION con't

Carcinogenacity
No evidence of carcinogenicity to animals.

Repeated Exposure
Long-term, high level exposure produced kidney injury in rats but not in mice.

Teratogenicity
Produced pre-implantation loss, delayed ossification and congenital malformations in rats and mice when administered by gavage or in drinking water during organogenesis; not teratogenic in mice following dermal application of up to 3550mg/kg/day, not teratogenic in mice by nose-only inhalation of up to 2500.mg/m3; no effect on fertility or reproductive performance in a three-generation study in rats.

Aquatic Toxicity
Goldfish (Carassius auratus) LC50 > 5 g/l (24h)
Brine Shrimp (Arternia salina) LC50 > 20 g/l (24h)

Studies have shown that this product is biodegradable in systems such as municipal waste treatment plants.

SECTION 11 – REGULATORY INFORMATION

RECIPIENT MUST COMMUNICATE ALL PERTINENT INFORMATION HEREIN TO EMPLOYEES AND CUSTOMERS.

State Regulations:
The following chemicals associated with the product are subject to the right-to-know regulations in these states:

ETHYLENE GLYCOL (107-21-1): Fl, IL, LA, MA, NJ, PA, and RI

US Federal Regulations
We certify that all components are either on the TSCA inventory or qualify for an exemption.

International Regulations
SARA 313: ETHYLENE GLYCOL 99.5% (107-21-1)

MSDS # 1154-000

ETHYLENE GLYCOL

SECTION 11 – REGULATORY INFORMATION con't

Environmental

CERCLA: ETHYLENE GLYCOL 99.5% (107-21-1)
SARA: ETHYLENE GLYCOL 99.5% (107-21-1)
SARA 31 1/3 12

Acute Health……..Yes

Chronic Health……Yes
Fire……No
Sudden Release of Pressure…….No
Reactive……No

Clean Air Act, 1990, section 112: ETHYLENE GLYCOL (107-21-1)

International Regulations

Listed on the chemical inventories of the following countries: Australia, Canada, Europe (EINECS), Japan and Korea.

WHMIS Ingredient Disclosure Listed Components:

ETHYLENE GLYCOL

SECTION 1 – OTHER INFORMATION

Hazard Ratings

	Health	Flamm	React	Other
NFPA	**1**	**1**	**0**	
HNIS	**1**	**1**	**0**	

THIS MATERIAL SAFETY DATA SHEET MUST BE REVIEWED EVERY THREE YEARS

ALPHA CHEMICAL LIMITED
MATERIAL SAFETY DATA SHEET

MSDS # 1119-0000

METHANOL

SECTION 1 – CHEMICAL PRODUCT and COMPANY INFORMATION

Product Name: Methanol (CH_3OH)
Synonyms: Methyl alcohol, methyl hydrate, wood spirit, methyl hydroxide

Product Use: Solvent, fuel, feedstock
WHMIS Classification: B2; D1A

ALPHA CHEMICAL LTD.
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SECTION 2 – HAZARDS INGREDIENT(S)

Component	%	Cas Number	LC_{50} ppm	LD_{50}
Methyl Alcohol	99.85	67-56-1	64,000 (inhalation-rat)	5.6-13.0 g/kg (oral, rat) 20 ml/kg (dermal-rabbit)

SECTION 3 – PHYSICAL INFORMATION

Appearance	Clear, colorless
Odor	Slight alcohol odor
Odor Threshold	2000 ppm, (irritation at 1000 ppm, poor olfactory warning properties)
Physical State	Liquid
Specific Gravity (H_20=1)	0.792
Vapor Pressure (at 20 ^{0}C)	96 mm Hg
Vapor Density (air =1)	1.105 @ 15 ^{0}C (59 ^{0}F)
Evaporation Rate (Butyl Acetate = 1)	2.1
Boiling Point (760 mmHg)	64.5 ^{0}C (148 ^{0}F)
Freezing Point	-97.8 ^{0}C (-144 ^{0}F)
Solubility in water (%ww)	Soluble
pH	Not applicable
Molecular wt	32.04
Volatile, percent by volume	100%
Water/Oil Distribution Coefficient	Readily soluble in water, separates from oil

SECTION 4 – FIRE OR EXPLOSION HAZARD

Flammable/Combustible	Yes, in the presence of ignition source
Flashpoint – (TCC)	15.6 ^{0}C (60 ^{0}F)
Flashpoint – (TOC)	11 ^{0}C (52 ^{0}F)
Upper Explosive Limit (%)	36% (NFPA 1978) 36.5% (Ullmann 1975)
Lower Explosive Limit (%)	6%
Autoignition Temperature	385 ^{0}C (NFPA 1978) 470 ^{0}C (Kirk-Othmer 1981; Ullmann 1975)
Sensitivity to Static Discharge	Low

SECTION 4– FIRE OR EXPLOSION HAZARD con't

Hazardous Products of Combustion
Toxic gases and vapors; oxides of carbon and formaldehyde

Extinguishing Media
Small fires: Dry Chemical CO_2, water spray
Large fires: Water spray, AFFF (R) (Aqueous Film Forming Foam (alcohol resistant) type with either a 3% or 6% foam proportioning system.

Special Firefighting Instructions
Methanol burns with a clean clear flame that is almost invisible in daylight. Stay upwind. Isolate and restrict area access. Concentrations of greater than 25% methanol in water can be ignited. Use fine water spray or fog to control fire spread and cool adjacent structures or containers. Contain fire control water for later disposal. Fire fighters must wear full face, positive pressure, self-contained breathing apparatus or airline and appropriate protective clothing. Protective fire fighting structural clothing is not effective protection from methanol. Do not walk through spilled product.

SECTION 5 – REACTIVITY INFORMATION

Chemical Stability
This product is stable

Hazardous Decomposition Products
Formaldehyde, carbon dioxide and carbon monoxide

Incompatibilities
Strong oxidizers, strong acids, strong bases. May be corrosive to lead, magnesium and platinum.

Conditions of Reactivity
Presence of incompatible materials and ignition sources.

SECTION 6 - TOXICOLOGICAL PROPERTIES

POTENTIAL HEALTH EFFECTS

Inhalation - Yes

Eye Contact – Moderate Irritant

Skin Contact - Irritant

Skin Absorption - Yes

Ingestion – Yes

Effects of Single Acute Exposure
Swallowing even small amounts of methanol may cause blindness or death. Effects of sub lethal doses may be nausea, headache, abdominal pain, vomiting and visual disturbances ranging from blurred vision to light sensitivity. Inhalation of high airborne concentrations can also irritate mucous membranes, cause headaches, sleepiness, nausea, confusion, loss of consciousness, digestive and visual disturbances and death. NOTE: The odor threshold of methanol is several times

SECTION 6 - TOXICOLOGICAL PROPERTIES con't

higher than the TLV-TWA. High vapor concentration or liquid contact with eyes causes irritation, tearing and burning. May be absorbed through the skin in toxic or lethal amounts.

Effects of Repeated Overexposure

Repeated exposure by inhalation or absorption may cause systemic poisoning, brain disorders, impaired vision and blindness. Inhalation may worsen conditions such as emphysema or bronchitis. Repeated skin contact may cause dermal irritation, dryness and cracking.

Exposure Limits

Methyl alcohol: ACGIH TLV-TWA = 200 ppm, STEL = 250 ppm – Skin notation
OSHA PEL = 200 ppm

Irritancy of Product: 1000 ppm in air may cause irritation of mucous membrane

SECTION 7 – PREVENTATIVE MEASURES

Engineering Controls

In confined areas, local and general ventilation should be provided to maintain airborne concentrations below permissible exposure limits. Ventilation systems must be designed according to approved engineering standards.

Eye Protection

Face shield and chemical splash goggles when transferring is taking place.

Gloves

Butyl and nitrile rubbers are recommended. Check with glove manufacturer.

Respiratory Protection

NIOSH approved supplied air respirator when airborne concentrations exceed exposure limits.

Clothing & Footwear

Wear chemical resistant pants, jackets and footwear, preferably butyl or nitrile rubber. Check with manufacturer.

NOTE:

PPE must not be considered a long-term solution to exposure control. PPE usage must be accompanied by employer programs to properly select, maintain, clean, fit and use. Consult a competent industrial hygiene resource to determine hazard potential and / or the PPE manufacturers to ensure adequate protection.

Storage Requirements

Store in totally enclosed equipment, designed to avoid ignition and human contact. Tanks must be grounded and vented and should have vapor emission controls. Tanks must be diked. Avoid storage with incompatible materials. Anhydrous methanol is non-corrosive to most metals at ambient temperatures except lead and magnesium. However coatings of copper (or copper alloys), zinc (including galvanized steel) or aluminum are unsuitable for storage as they are attacked slowly. Storage tanks of welded construction are normally satisfactory. They should be designed and built in conformance with good engineering practice for the material being used. Mild steel is the recommended construction material. Tanks built with copper alloys (including coatings of copper), zinc (including galvanized steel), aluminum are not suitable for methanol-water solutions. While plastics can be used for short-term storage, they are generally not recommended for long-term storage due to deterioration effects and the subsequent risk of contamination.

SECTION 7 – PREVENTATIVE MEASURES con't

Handling
No smoking or open flame in storage, use or handling areas. Use explosion proof electrical equipment. Ensure proper electrical grounding procedures are in place.

Spill or Leak Response
Flammable liquid. Release can cause an immediate fire/explosion hazard. Eliminate all ignition sources, stop leak and use absorbent materials. If necessary, contain spill by diking. Fluorocarbon alcohol resistant foams may be applied to spill to diminish vapor and fire hazard. Maximize methanol recovery for recycling or reuse. Collect liquid with explosion proof pumps. For small spills, collect with a non-combustible sorbent. Recover methanol or dilute with water to reduce fire hazard. Prevent spilled methanol from entering sewers, confined spaces, drains or waterways. Restrict access by unprotected personnel. Full-face, positive pressure self-contained breathing apparatus or airline and protective clothing must be worn. Protective fire fighting structural clothing is not effective protection from methanol. Do not walk through spilled product as it may be on fire and not visible.

WASTE INFORMATION

Disposal
Incineration is the recommended disposal method. Biological treatment may be used on dilute aqueous waste methanol. Methanol wastes are not suitable for underground injection. Waste materials must be disposed of in accordance with your municipal, federal and provincial regulations.
Contact the proper authorities for specific instructions.

SECTION 8 – FIRST AID MEASURES

Eyes
Flush immediately with gently running water for a minimum of 15 minutes, ensuring all surfaces and crevices are flushed by lifting lower and upper lids. Obtain medical attention.

Skin
Remove contaminated clothing; wash under shower with soap and water for 15 minutes. Seek medical attention if irritation occurs.

Inhalation
Remove to fresh air, restore or assist breathing if necessary, obtain medical attention immediately.

Ingestion
Swallowing methanol is life threatening. Onset of symptoms may be delayed for 18 to 24 hours after ingestion. If conscious and medical aid is not immediately available, **do not induce vomiting**. Transport to medical attention.

NOTE TO PHYSICIAN: Acute exposure to methanol, either through ingestion or breathing high airborne concentrations can result in symptoms appearing between 40 minutes and 72 hours after exposure. Symptoms and signs are usually limited to CNS, eyes and gastrointestinal tract. Because of the initial CNS's effects of headache, vertigo, lethargy and confusion, there may be an impression of ethanol intoxication. Blurred vision, decreased acuity and photophobia are common complaints. Treatment with ipecac or lavage is indicated in any patient presenting within two hours of ingestion. A profound metabolic acidosis occurs in severe poisoning and serum bicarbonate levels are a more accurate measure of severity than serum methanol levels. Treatment protocols are available from most major hospitals and early collaboration with appropriate hospitals is recommended.

METHANOL

SECTION 9 – TRANSPORT INFORMATION

TDG CLASSIFICATION

METHANOL
Class 3 (6.1), UN1230, Packing Group II

THIS MATERIAL SAFETY DATA SHEET MUST BE REVIEWED EVERY THREE YEARS

MSDS # 1297-0214

N-METHYLDIETHANOLAMINE (MDEA)

SECTION 1 – CHEMICAL PRODUCT and COMPANY INFORMATION

Product Name: N-Methyldiethanolamine (MDEA)
Synonyms: N, N-di(2-hydroxyethyl)-N-Methylamine
Chemical Family: Alkanolamine
Formula: $CH_3 – N – (CH_2 – CH_2 – OH)_2$

Product Use: Sulfide Scavenger
WHMIS Classification: D2B

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Prepared By: Safety Department
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Alpha Chemical 1(902) 481-2532 OR 1(800) 981-2532
EMERGENCY: CANUTEC (613) 996-6666

SECTION 2 – HAZARDS INGREDIENT(S)

Component	%	Cas Number	LC_{50}	LD_{50}
N-Methyldiethanolamine	> 99	105-59-9		4780 mg/kg (oral, rat)

SECTION 3 – PHYSICAL INFORMATION

Appearance	Transparent, colorless
Odor	Ammoniacal fishy
Physical State	Liquid
Specific Gravity (H_20=1)	1.044 max @ 20 ^{0}C
Vapor Pressure (at 20 ^{0}C)	0.01 mmHg
Vapor Density (air =1)	4.0
Evaporation Rate (Butyl Acetate = 1)	<0.01
Boiling Point (760 mmHg)	247.2 ^{0}C
Freezing Point	-21 ^{0}C
Solubility in water (%w/w)	100% @ 20 ^{0}C
pH	Not determined

SECTION 4 – FIRE OR EXPLOSION HAZARD

Flammable Material	No
Flashpoint - Open Cup	137 ^{0}C (Cleveland Open Cup)
Upper Flammable Limit	8.8
Lower Flammable Limit	1.4
Autoignition Temperature	Not Currently Available

SECTION 4 (con't) – FIRE OR EXPLOSION HAZARD

Hazardous Products of Combustion
Burning can produce the following products: Carbon monoxide and / or carbon dioxide. Oxides of Nitrogen. Carbon monoxide is highly toxic if inhaled. Carbon dioxide in sufficient concentrations can act as an asphyxiant. Acute overexposure to the products of combustion may result in irritation of the respiratory tract.

Unusual Fire and Explosion Hazards
During a fire, oxides of nitrogen may be produced.

Extinguishing Media
Extinguish fires with water spray or apply alcohol-type or all-purpose-type foam by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

Special Protective Equipment for Firefighters
Use self-contained breathing apparatus and protective clothing.

SECTION 5 – REACTIVITY INFORMATION

Chemical Stability
This product is stable.

Hazardous Polymerization
Will not occur.

Incompatibilities
Strong oxidizing agents. Strong acids. Organic Acids. Organic Anhydrides.

Inhibitors/Stabilizers
Not applicable.

Hazardous Products
WARNING! Do not mix this product with nitrites or other nitrosating agents because a nitrosamine may be formed. Nitrosamines may cause cancer.

SECTION 6 - HEALTH HAZARD INFORMATION

WARNING!

HARMFUL IS ABSORBED THROUGH THE SKIN. HARMFUL IF SWALLOWED. CAUSES EYE AND SKIN IRRITATION.

ASPIRATION MAY CAUSE LUNG DAMAGE. VAPOR MAY CAUSE TEMPORARY BLURRING OF VISION

SECTION 6 con't - HEALTH HAZARD INFORMATION

POTENTIAL HEALTH EFFECTS

Effects of Single Acute Overexposure

Inhalation
Short-term, harmful health effects are not expected from vapor generated at ambient temperature. Prolonged overexposure may cause injury to the respiratory tract.

Eye Contact
Liquid causes severe irritation, experienced as discomfort pain, excess blinking and tear production with marked redness and swelling of the conjunctive. Corneal injury may occur. Vapor may cause temporary disturbance of vision.

Skin Contact
Brief contact may cause slight irritation with itching, local redness and possibly swelling. Sustained contact of many hours may cause more severe redness and swelling with the development of fissures and possibly bleeding into the inflamed area.

Skin Absorption
Prolonged or widespread contact may result in the absorption of potentially harmful amounts of material.

Ingestion
Moderately toxic. May cause irritation of the mouth, throat, esophagus and stomach with pain or discomfort in the mouth, throat, chest and abdomen, nausea, vomiting, diarrhea, thirst, dizziness, drowsiness and weakness. There may be difficulty in swallowing. Aspiration into the lungs may occur during ingestion or vomiting, resulting in lung injury.

Chronic, Prolonged or Repeated Overexposure

Effects of Repeated Overexposure
Repeated contact with skin may cause a severe cumulative dermatitis.

Other Effects of Overexposure
This material did not show a skin sensitizing potential in a guinea pig maximization test.

Medical Conditions Aggravated by Exposure
Skin contact may aggravate an existing dermatitis.

SECTION 6 con't – HEALTH HAZARD INFORMATION

TOXICOLOGICAL INFORMATION

ACUTE TOXICITY
Peroral
Rat; male; LD50 = 1.87 (1.26-2.76) ml/kg

Major Signs
Sluggishness, lacimation, piloerectin, diarrhea, bloody discharge on periurogenital fur.

Gross Pathology
Stomach and intestines discolored, fluid-filled.

Peroral
Rat, female; LD50 = 1.87 (1.29-2.70) ml/kg

Major signs
Sluggishness, lacrimation, piloerection, diarrhea, bloody discharge on periurogenital fur.

Gross Pathology
Stomach and intestines discolored, fluid-filled.

Percutaneous
Rabbit; male; LD50 = 9.85 (7.15-13.6) ml/kg; 24 h occluded.

Major Signs
Ecchymosis, erythema, edema and necrosis at application site; sluggishness, emaciation, salivation, perioral/perinsasal encrustation.

Gross Pathology
Lungs discolored, black to tan foci on abdominal viscera, kidney surfaces pitted.

Percutaneous
Rabbit; female; LD50 = 10.9 (8.98-13.3) ml/kg; 24 h occluded.

Major Signs
Ecchymosis, erythema, edema and necrosis at application site; sluggishness, emaciation, salivation, perioral/perinasal encrustation.

Gross Pathology
Lungs discolored, black to tan foci on abdominal viscera, kidney surfaces pitted.

SECTION 6 con't – HEALTH HAZARD INFORMATION

Inhalation
Static generation of substantially saturated vapor, Rat; male; 25 ^{0}C.

Mortality: 0 / 5

Irritation
Skin: Rabbit; 4 h occluded
Results: Minor to moderate erythema in 3/6, minor to moderate edema and ecchymosis in 2/6.

Eye: Rabbit; 0.01 ml

Significant Data with Possible Relevance to Humans
This material was not genotoxic in various mutagenicity and clastogenicity tests. No development effects were observed in pregnant rats treated cutaneously with maternal toxic dosages of N-methyldiethanolamine. Contains one or more amines, which may react with nitrites to form nitrosamines. Some nitrosamines have been shown to be carcinogenic in laboratory animals.

SECTION 7 – PREVENTATIVE MEASURES

Special Precautions
Do not add nitrites or other nitrosating agents. A nitrosamine, which may cause cancer, may be formed.

PERSONAL PROTECTION

Eye Protection
Mono goggles.

Gloves
Viton, Neoprene, Nitrile or Butyl.

Respiratory Protection
Use self-contained breathing apparatus in high vapor concentrations.

Ventilation
General (mechanical) room ventilation is expected to be satisfactory where this product is stored and handled in closed equipment. Special, local ventilation and a vent gas scrubber are needed at points where vapors can be expected to escape to the workplace air.

Skin
Coveralls and chemical apron.

SECTION 7 con't – PREVENTATIVE MEASURES

Storage Requirements
Store in accordance with good industrial practices. Keep container closed. Keep away from nitrites or other nitrosating agents.

Handling
Do not get into eyes, on skin or clothing. Do not swallow. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

Small Spill and Leak
Small spills can be flushed with large amounts of water.

WASTE INFORMATION

Incinerate in a furnace where permitted under Federal, Provincial and Local regulations. Dispose in accordance with all Federal, Provincial and Local environmental regulations. Empty containers should be recycled or disposed of through an approved waste management facility.

Disposal
Laboratory tests indicate that this material is biodegradable at very low concentrations (~ 10 ppm) in water. If spilled material cannot be collected, it may be possible to neutralize with dilute hydrochloric acid; then, landfill the neutral salt.

Process Hazard
Sudden release of hot organic chemical vapor mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into hot equipment under a vacuum, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated-temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions.

SECTION 8 – FIRST AID MEASURES

Eyes
Immediately flush eyes with water and continue washing for at least 15 minutes. **DO NOT** remove contact lenses, if worn. Obtain medical attention without delay, preferably from an opthamologist.

Skin
Remove contaminated clothing. Wash skin with soap and water. Obtain medical attention if contact has been widespread and prolonged, or if irritation persists. Wash clothing before re-use.

Inhalation
Remove to fresh air.

SECTION 8 con't – FIRST AID MEASURES

Ingestion
If patient is fully conscious, give two glasses of milk or water at once. **DO NOT INDUCE VOMITING!** Obtain medical attention without delay.

NOTE TO PHYSICIAN
There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. Slight skin irritant. Moderate eye irritant. Due to the irritant nature of the material, the stomach should be evacuated carefully in cases of poisoning by swallowing. Any material aspirated during vomiting may cause lung injury. Therefore, emesis should not be induced mechanically or pharmacologically. If it is considered necessary to evacuate the stomach contents, this should be done by means least likely to cause aspiration (e.g. gastric lavage after endotracheal intubation).

Exposure to the vapor may cause minor transient edema of the corneal epithelium. This condition, referred to as "glaucopsia", "blue haze" or "blue-gray haze", produces a blurring of vision against a general bluish haze and the appearance of halos around bright objects. The effect disappears spontaneously within a few hours of the end of an exposure and leaves no sequelac. Although not detrimental to the eye per se, glaucopsia predisposes and affected individual to physical accidents and reduces the ability to undertake skilled tasks, such as driving a motorized vehicle.

SECTION 9 – TRANSPORT INFORMATION

TDG CLASSIFICATION: **NON REGULATED**

SECTION 10 – ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE

BOD (% Oxygen Consumption)

Day 5	Day 10	Day 15	Day 20	Day 30
5%	6%		87%	

ECOTOXICITY

Toxicity to Micro-Organisms
Bacterial / NA; 16h; IC50
Result Value: > 1000 mg/l

Toxicity to Aquatic Invertebrates
Daphnia; 48h; LC50
Result Value: 332 (290-380) mg/l

N-METHYLDIETHANOLAMINE (MDEA)

SECTION 10 con't – ECOLOGICAL INFORMATION

Toxicity to Fish
Fathead to Minnow; 96h; LC50
Result Value: 1170 (1030-1330) mg/l

Toxicity to Fish
Fathead Minnow; 96h; NOEC
Result Value: (500-600) mg/l

FURTHER INFORMATION
Chemical Oxygen Demand (COD) – measured: 1.75 mg/mg
Theoretical Oxygen Demand (THOD) – measured: 0.54 mg/mg

SECTION 11 – REGULATORY INFORMATION

THE INFORMATION ACCUMULATED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE WHETHER ORIGINATING WITH THE COMPANY OR NOT. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE TO THEIR CIRCUMSTANCES. RECIPIENT MUST COMMUNICATE ALL PERTINENT INFORMATION HEREIN TO EMPLOYEES AND CUSTOMERS.

THIS MATERIAL SAFETY DATA SHEET MUST BE REVIEWED EVERY THREE YEARS

Comet Chemical Company Ltd.

3463 Thomas Street Innisfil ,ON L9S 3W4
Tel: (705) 436-5580 Fax: (705) 436-7194

Materials Safety Data - PCL BLEND #3

	UN - 1993
Shipping Name	FLAMMABLE LIQUID, N.O.S (ETHYL ALCOHOL)
Transport of Dangerous Goods Class	Class 3; Packing Group II
WHMIS Class	B 2; D 2B
Material Use	solvent

1. HAZARDOUS INGREDIENTS

	CAS NUMBER	%	TWAEV (ppm)	LD_{50} ORAL	(mg/kg) SKIN	LC_{50} ppm INHALATION
Ethyl Alcohol	64-17-5	60-90%	1000	3500	20,000	20,000
Methyl Alcohol	67-56-1	5-15%	200	5600	16,000	64,000
n-Propyl Alcohol	71-23-8	1-15%	200	1870	4050	19,500
n-Propyl Acetate	109-60-4	1-10%	200	6640	20,000	9100

Note: LD50 & LC50 varies mukedly between species, lowest value given above

2. PHYSICAL CHARACTERISTICS

Odour & Appearance	clear, colourless, liquid with sharp, sweetish alcohol odour
Odour Threshold	probably below 20ppm
Vapour Pressure	below 12 kPa (20°C)
Vapour Density (air = 1)	above 1.4
Boiling Range	74°C - 102°C
Freezing Point	below -95°C
Specific Gravity	0.797 (20°C)
Water Solubility	high - may be completely soluble

3. FLAMMABILITY & REACTIVITY

Flash Point	above -12°C
Autoignition Temperature	above 385°C
Flammable Limits	not known
Hazardous Combustion Products	carbon monoxide, nitrogen oxides, smoke
Firefighting Precautions	foam, dry chemical, water fog, water spray only to cool, product floats on water - water jet spreads flames; firefighters must wear SCBA
Sensitivity to Static Discharge	will not accumulate a static charge
Sensitivity to Mechanical Impact	not sensitive
Chemical Stability	stable; will not polymerize
Reactive With	strong oxidising agents;concentrated inorganic acids, aldehydes, halogens, may form explosive compounds with aqua ammonia
Decomposition Products	apart from "Hazardous Combustion Products", toxic fumes on heating

4. TOXICOLOGY

EFFECTS OF ACUTE EXPOSURE

Skin Contact	drying, may be mildly irritating
Skin Absorption	yes; toxic effects not anticipated by this route, partly due to evaporation
Eye Contact	irritating liquid; vapour irritating when product heated to 50°C
Inhalation	irritating; headache, dizzyness, drowsiness, intoxication, eventual anaesthesia
Ingestion	headache, dizzyness, drowsiness, intoxication

(PCL#3, cont'd)

EFFECTS OF CHRONIC EXPOSURE

General	prolonged exposure may cause skin cracking and dermatitis repeated absorption may damage kidneys, liver and cause blindness
Sensitising	no
Carcinogenic	no known effect in humans
Reproductive Effect	reproductive toxin in rodents at high doses; absorption in quantity may cause developmental abnormalities in humans
Synergistic With	existing liver disease
Estimated LD_{50}	3478 mg/kg (oral); 14,025 mg/kg (skin)
Estimated LC_{50}	20,833 ppm (inhalation)

5. PROTECTIVE EQUIPMENT

Hands	butyl rubber, Viton gloves recommended; *other types may also be suitable – check with your supplier*
Eyes	safety glasses with side shields
Respirator	not required if ventilation is adequate (see TWAEV, (1) above), or use organic vapour cartridge
Clothing	butyl rubber or neoprene apron, boots, long sleeves, if splashing is anticipated

6. ENVIRONMENT

Leak Precaution — dyke to control spillage and prevent ground water contamination

<< ***Fire Risk:*** ***blanket spill with foam to prevent accidental ignition*** >>

Handling Spill — ventilate contaminated area; recover free liquid with explosion-proof pumps; absorb residue on an inert sorbent (dry sand, earth), sweep or shovel ***(use non-sparking plastic or aluminum shovel only)*** store in closed containers for disposal

Waste Disposal — readily biodegradeable if well aerated, this solvent is not biodegradeable in underground aquifers, and must not enter ground water; do not flush to sewer, may be incinerated in approved facility

7. STORAGE & HANDLING

Store and use in a cool dry environment, away from sources of ignition, heat and oxidising agents. Use with adequate ventilation. Although this product is not a static accumulator, ground the container before handling to prevent static discharge which may cause ignition. Do not cut, drill, weld or grind on or near this container. Avoid prolonged contact with skin and wash work clothes frequently. An eye bath and safety shower should be available near the workplace.

8. FIRST AID

SKIN:	Wash with soap and plenty of water. Remove contaminated clothing and do not reuse until thoroughly cleaned or laundered.
EYES:	Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is any irritation.
INHALATION:	Remove from contaminated area promptly. **CAUTION: Rescuer must not endanger himself!** If breathing stops, administer artificial respiration and seek medical aid promptly.
INGESTION:	Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, keep victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

NOTE: Inadvertent inhalation of vomited material may seriously damage the lungs. The risk and danger of this is greater than the risk of poisoning through absorption of this product. The stomach should be emptied under medical supervision, after the installation of an airway to protect the lungs.

Emergency telephone numbers	- weekdays from 8:00 - 5:00	(705) 436-5580
	at all other times	(800) 567-7455 (Philip Environmental)

Prepared for Comet Chemical Co. Ltd., by ***Nicholas Morgan, April 2003***

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

PLEASE ENSURE THAT THIS **MSDS** *IS GIVEN TO AND* **EXPLAINED** *TO THE PERSON USING THIS PRODUCT.*