

5.2 SPILL RESPONSE ACTIONS DIESEL FUEL, HYDRAULIC OIL, AND LUBRICATING OIL

**Take action only if safety permits – stop the source flow if safe to do so and eliminate all ignition sources.
Never smoke when dealing with these types of spills.**

On Land

Build a containment berm using soil material or snow and place a plastic tarp at the foot of the berm for easy capture of the spill after all vapours have dissipated.

Remove the spill by using absorbent pads or excavating the soil, gravel or snow.

Remove spill splashed on vegetation using particulate absorbent material.

If soil, gravel, or vegetation must be removed, contact regulatory agencies for approval before commencing with the removal.

On Muskeg

Do not deploy personnel and equipment on marsh or vegetation.

Remove pooled oil with sorbent pads and/or skimmer.

Flush with low pressure water to herd oil to collection point.

Burn only in localized areas, e.g., trenches, piles or windrows.

Do not burn if root systems can be damaged (low water table).

Minimize damage caused by equipment and excavation.

On Water

Contain spill as close to release point as possible.

Use containment boom to capture spill for recovery after vapours have dissipated.

Use absorbent pads to capture small spills.

Use skimmer for larger spills.

On Rivers and Streams

Prevent entry into water, if possible, by building a berm or trench.

Intercept moving slicks in quiet areas using (sorbent) booms.

Do not use sorbent booms/pads in fast currents and turbulent water.

On Ice and Snow

Build a containment berm around spill using snow.

Remove spill using absorbent pads or particulate sorbent material.

The contaminated ice and snow must be scraped and shoveled into plastic buckets with lids, 205 litre drums, and/or polypropylene bags.

Storage and Transfer

All contaminated water, ice, snow, soil, and clean up supplies will be stored in closed, labeled containers. All containers will be stored in a well ventilated area away from incompatible materials.

Disposal

Contact Federal and Territorial regulatory agencies to identify appropriate disposal methods before disposing of contaminated material.

5.3 SPILL RESPONSE ACTIONS
GASOLINE AND JET B AVIATION FUEL
Gasoline and Jet B form vapours that can ignite and explode – No Smoking!

Take action only if safety permits – stop the source flow if safe to do so and eliminate all ignition sources.
Never smoke when dealing with these types of spills.

On Land

Build a containment berm using soil material or snow and place a plastic tarp at the foot of the berm for easy capture of the spill after all vapours have dissipated.

Remove the spill by using absorbent pads or excavating the soil, gravel or snow.

Remove spill splashed on vegetation using particulate absorbent material.

If soil, gravel, or vegetation must be removed, contact regulatory agencies for approval before commencing with the removal.

On Muskeg

Do not deploy personnel and equipment on marsh or vegetation.

Remove pooled gasoline or Jet B with sorbent pads and/or skimmer.

Flush with low pressure water to herd oil to collection point.

Burn only in localized areas, e.g., trenches, piles or windrows.

Do not burn if root systems can be damaged (low water table).

Minimize damage caused by equipment and excavation.

On Water

Contain spill as close to release point as possible.

Use containment boom to capture spill for recovery after vapours have dissipated.

Use absorbent pads to capture small spills.

Use skimmer for larger spills.

On Rivers and Streams

Prevent entry into water, if possible, by building a berm or trench.

Intercept moving slicks in quiet areas using (sorbent) booms.

Do not use sorbent booms/pads in fast currents and turbulent water.

On Ice and Snow

Build a containment berm around spill using snow.

Remove spill using absorbent pads or particulate sorbent material.

The contaminated ice and snow must be scraped and shoveled into plastic buckets with lids, 205 litre drums, and/or polypropylene bags.

Storage and Transfer

All contaminated water, ice, snow, soil, and clean up supplies will be stored in closed, labeled containers. All containers will be stored in a well ventilated area away from incompatible materials.

Disposal

Contact Federal and Territorial regulatory agencies to identify appropriate disposal methods before disposing of contaminated material.

5.4 SPILL RESPONSE ACTIONS ANTIFREEZE

Take action only if safety permits – stop the source flow if safe to do so.

On Land

Build a containment berm using soil material or snow and place a plastic tarp at the foot of the berm for easy capture of the spill.

Remove the spill by using absorbent pads or excavating the soil, gravel, or snow.

Remove spill splashed on vegetation using particulate absorbent material.

If soil, gravel, or vegetation must be removed, contact regulatory agencies for approval before commencing with the removal.

On Water

Use containment boom to capture spill.

Pump contaminated water into 206 litre drum.

On Ice and Snow

Build a containment berm around spill using snow.

Remove spill using particulate sorbent material.

The contaminated sorbent material, ice and snow must be scraped and shoveled into plastic buckets with lids, 206 litre drums, and/or polypropylene bags.

Storage and Transfer

All contaminated water, ice, snow, soil, and clean up supplies will be stored in closed, labeled containers. All containers will be stored in a well ventilated area away from incompatible materials.

Disposal

Contact Federal and Territorial regulatory agencies to identify appropriate disposal methods before disposing of contaminated material.

5.5 SPILL RESPONSE ACTIONS PROPANE

Take action only if safety permits. Gases stored in cylinders can explode when ignited. Keep vehicles away from accident area – No Smoking!

On Land

Do not attempt to contain the propane release.

On Water

Do not attempt to contain the propane release.

On Ice and Snow

Do not attempt to contain the propane release.

General

It is not possible to contain vapours when released.

Water spray can be used to knock down vapours if there is NO chance of ignition.

Small fires can be extinguished with dry chemical or CO₂.

Personnel should withdraw immediately from area unless a small leak is stopped immediately after it has been detected.

If tanks are damaged, gas should be allowed to disperse and no recovery attempt should be made.

Personnel should avoid touching release point on containers since frost forms very rapidly.

Keep away from tank ends.

Storage and Transfer

It is not possible to contain vapours when released.

Disposal

Contact Federal and Territorial regulatory agencies to identify appropriate disposal methods for defective equipment that resulted in the release.

6.0 RESOURCE INVENTORY

6.1 PERSONNEL

In addition to the On Scene Coordinator and the Project Manager, approximately 3 to 14 people are available on site to assist in spill response and clean up activities. The amount of people on site varies throughout the year.

6.2 GENERAL EQUIPMENT

Equipment available on site to assist in responding to a hazardous materials spill includes various hand held tools including shovels. In addition to these, one spill kit will be on site during active exploration periods. The spill kit contains the following supplies:

- 1 – 360 litre/79 gallon polyethylene overpack drum
- 4 – oil sorbent booms (5" X 10')
- 100 – oil sorbent sheets (16.5" X 20" X 3/8")
- 1 – drain cover (36" X 36" X 1/16")
- 1 – Caution tape (3" X 500')
- 1 – 1 lb plugging compound
- 2 – pair Nitrile gloves
- 2 – pair Safety goggles
- 2 – pair Tyvek coveralls
- 1 – instruction booklet
- 10 – printed disposable bags (24" X 48")

Sorbent capacity of this spill kit is 240 litres.

7.0 TRAINING

All employees working on a Diamondex Resources Ltd. exploration property will be trained in the safe operation of all machinery and tools to help prevent hazardous material spills. All employees on site will also be trained for initial spill response in the event of a spill. Annual refresher exercises will be conducted to review the procedures of this Spill Contingency Plan.

DIAMOND DRILL PRODUCT DESCRIPTION SHEETS

DR-133 POLYMER

Description: DR-133 POLYMER is an advanced formula liquid polymer designed for a wide range of drilling applications.

Principal Use: • Provides lifting capabilities in all hole depths.

- Maintains hole conditions in friable zones such as overburden, silts, sands and clay.

- Non-shearing formula provides excellent hole cleaning and stability.

- Superior lubricating qualities eliminate vibration while increasing core recovery.

- Encapsulating structure reduces swelling of clays and caving shales.

Mixing: • Add 2 litres of DR-133 POLYMER per 250 gallons of water. Mix well.

- Then add 2 litres of W-OB POLYMER to the above volume while mixer is on.

- For troublesome hole conditions increase the above recommended quantities of both products.

- Always mix DR-133 POLYMER first before adding W-OB POLYMER.

Environment: • Non-dangerous goods.

Packaging: 2 x 10 litre plastic jugs in a carton.

550X POLYMER

Description: Composition of product: Concentrated, granular copolymer of sodium acrylamides/acrylates.

Principal Uses: By introducing 550X to appropriate drilling operations, the following practical advantages can be expected:

- 100% recovery of organic formations
- Excellent stability of walls or holes
- Diameter of hole practically identical to diameter of tool
- No problem with removal of casing
- Torque lessened by 20 - 30%
- Faster penetration rate
- Reduction in control and mud-production equipment
- Reduction in wear on tubular material
- Reduction in storage on site, volume of supplies and transport costs
- Reduction in water consumption
- Important time saving (drilling, maintenance, etc.)

Mixing: 550X can be mixed readily with fresh water. Sprinkle slowly onto agitated, turbulent water. Hydration is almost immediate. Depending on water flow, approximately 1m³ of mud can be mixed in 5 minutes. This mud is then ready for use.

Environment: Dangerous components: None

Potentially dangerous impurities: None

Physical properties: White solid at 20 Degrees C

Measures to be taken after leakage or accidental spilling: Wash abundantly with water and bleach

Inflammability or danger of explosion: None

Poisonous properties: Non-toxic, slightly basic

First Aid measures: Wash with water

Packaging: 20 kg. High impact plastic pail with handle, .5 kg tubs - 20 per box,
1 kg plastic bags - 20 per box

WDS 120L

Description: WDS 120L is a white, liquid anionic polymer which is easily mixed in fresh or brine water systems. WDS 120L yields a solids-free drilling fluid which provides excellent hole stabilizing qualities when used in plain water, X-TRA GEL fluids or in foam drilling fluids.

Principal Uses: WDS 120L added to plain water stabilizes swelling, caving and easily disintegrated formations, provides drill string lubrication reducing torque, rod chatter and pump pressure.

WDS 120L, when added to a pre-mixed X-TRA GEL drilling fluid, greatly improves the properties which affect hole cleaning and formation stabilization.

WDS 120L, when used in foam drilling fluids, provides greater foam stability which results in larger chip samples (cuttings), faster penetration, reduced air and water requirements and prevents clay/shale from swelling and sticking.

WDS 120L is safe to use in drilling for potable water well and will not damage producing formations. It can be broken down with sodium hypochlorite (clorox) for water well completions or hydrology testing.

Environment: WDS120L is environmentally acceptable, is non-toxic and does not ferment. When mixed with water it is tasteless, odourless and colourless.

Packaging: WDS 120L is supplied in a high impact, 20 litre plastic drum with a handle and pour spout.

LUBTUB

Description: LUBTUB is a liquid polymer solution. The high encapsulating and anti-swelling ability of the liquid product LUBTUB does away with drilling problems in swelling formations.

Principal Uses: LUBTUB is the indispensable product to use through swelling and easily wetted formations (plastic, sticky clay, gumbo-type, swelling marl, etc.) in each drilling, coring or non-cored method (tricone or drag bit) LUBTUB will:

- reduce tool binding
- stabilize hole walls
- prevent drilled soils hydrating
- prevent plastic soils from being redrilled
- improve hydraulic results
- reduce wear on tools and connections
- allow removal of casing without problem

Concentration: DRILLING OR CORING IN CLAYS AND MARLY STICKY FORMATIONS
2 to 3 litres per 250 gallons of water

Environment: - Composition: Sodium polyacrylate in 30% aqueous solution

HAZARDOUS COMPONENTS: None

POTENTIALLY HAZARDOUS IMPURITIES: NONE

- Ignition and Explosion: None
- Toxicological Information: NON TOXIC
- First Aid Action: wash with water
- Specific Hazards: NONE

Packaging: In 20 litre high impact plastic container with handle and pour spout.

GSX 20

Description: GSX 20 is a sulphured biodegradable non-polluting complex. It is guaranteed not to affect the measurement of fluorescence, permeability, porosity and physio-chemical analyses.

Action on Diamond: GSX 20 provides a constant diamond cooling by instant heat transfer. As the diamond is always cold and wet, its wear is reduced.

Action on the Matrix: GSX 20 increases matrix mechanical characteristics by its cooling action and reduces friction.

Environment: GSX 20 does not include metals like: cadmium, nickel, lead, mercury, arsenic, selenium and cobalt.

Concentration: Thoroughly mix .5 litres of GSX 20 into 1000 litres of fresh water. These figures reflect actual field consumptions on different programs over an extended period of time.

Packaging: In high impact plastic drums (20 litres) with handle and pour spout.

LINSEED SOAP

Description: LINSEED SOAP is a lubricating grease made from a mixture of linseed oil, fatty soaps and surfactants. It is a semi-solid paste, brown in colour.

Application: LINSEED SOAP can be swabbed inside inner tubes, added to drill fluid through a suction hose applicator or flushed into holding tanks with a water spray. Immediate results will occur by increased core recovery and increased bit footage.

WHMIS: This product is not a WHMIS controlled substance.

TDG: This product is not regulated under TDG.

Packaging: 23 kg recyclable plastic pails.

VOLCLAY GROUT II

Description Volclay Grout II is a granular, 25% solids, polymer free, single component, bentonite grout. Volclay Grout II high density grout, has advantages which allow placement in a low viscosity state. Expansion of the bentonite occurs downhole, resulting in an easy mixing, smooth uniform slurry.

Recommended

Use Volclay Grout II is designed for use in sealing well casings, geothermal heat pump loop systems, and decommissioning abandoned wells.

Advantages Higher solids results in less setting

Low dust

Mixes and pumps with ease

Pumping equipment is easily cleaned

More user friendly than bentonite / polymer grouts

Mixing and

Application For best results, Volclay Grout II is designed to be mixed at 25% solids.

Add one 50 pound bag of Volclay Grout II to 18 gallons of freshwater to produce 3.0 ft³ of grout. Pump grout through a tremie pipe from the bottom of the borehole to the surface. Pumping should continue until the grout purged to the surface reaches the proper mud weight. If a porous formation is encountered where there is potential for a large grout loss, a 26% to 27% solids mixture is recommended.

The following mixing ratios are recommended based on the desired percentage of solids:

Solids water / 50LB bag Mud wt. Yield

25% 18 Gallons 9.6 lb./gal. 3.0 cu.ft

26% 17 Gallons 9.7 lb./gal. 2.9 cu.ft

27% 16 Gallons 9.8 lb./gal. 2.8 cu.ft

Packaging: 50 lb. multiwall, water resistant bags, 48 bags per pallet. All pallets are shrinkwrapped.

BIG BEAR ROD GREASE

Specially thickened extreme pressure grease with additives that provide corrosion, wear and oxidation resistance. Tackiness assures adherence to drill rods while providing superior resistance to water washing and centrifugal separation. It possesses the right degree of fibrous characteristics to permit easy smearing of the drill rods by hand. As the rods are lowered into the drill hole, an adhesive film is formed on the rods that is resistant to the washing action of the water and "sludge" containing rock cuttings. This film of grease is a durable one that will prevent momentary seizure and chattering of the rods or binding in the hole. The frequency of pulling the rods for greasing is reduced and increased drilling costs are avoided.

Typical Properties: Colour: brownish yellow

Texture: long fibre

Penetration: ASTM

Worked at 25° C 212

Dropping point, ° C 252

Dropping point, ° F 485

Viscosity, cSt at 40° C (104° F) 84.6

cSt at 100° C (212° F) 7.8

SUS at 40° C (104° F) 392

SUS at 100° C (212° F) 52

Pour point, ° C -27

Pour point, ° F -15

Recommended Uses: BIG BEAR ROD GREASE is recommended for grease lubrication on diamond drill rods whether operating on the surface or underground.

Packaging: 17 kg pail.

FUEL PRODUCTS DESCRIPTION SHEETS

MSDS FOR FUEL PRODUCTS

Light distillate(diesel), propane, Jet B, gasoline, antifreeze

1. LIGHT DISTILLATE MSDS Number: 08529

ESSO STOVE OIL (DYED OR CLEAR)
DIESEL ARCTIC (DYED OR CLEAR)
ESSO DIESEL DEW (DYED OR CLEAR)
ESSO DIESEL ARCTIC (DYED OR CLEAR)
ESSO STOVE QUALITY COMMERCIAL FUEL
ESSO STOVE QUALITY FURNACE FUEL
ESSO STOVE QUALITY HEATING OIL (DYED OR CLEAR)
STOVE QUALITY FURNACE FUEL
DIESEL 60 (DYED OR CLEAR)
DIESEL DEW (DYED OR CLEAR)
ESSO DIESEL 60 (DYED OR CLEAR)
ESSO DIESEL LIGHT (DYED OR CLEAR)
STOVE OIL (DYED OR CLEAR)
STOVE QUALITY HEATING OIL (DYED OR CLEAR)
ESSO DIESEL FUEL OIL 50 (DYED OR CLEAR)
DIESEL LOW SULFUR LIGHT (DYED OR CLEAR)
LIGHT DISTILLATE (LOW SULFUR)
STOVE QUALITY COMMERCIAL FUEL
DIESEL FUEL OIL 50 (DYED OR CLEAR)
DIESEL LIGHT (DYED OR CLEAR)
DIESEL LOW SULFUR LIGHT DYED EP
FURNACE LIGHT (DYED OR CLEAR)
MC SOLVENT
DIESEL LOW SULPHUR LIGHT RAIL
FURNACE LOW SULPHUR
FURNACE LOW SULPHUR DYED
FURNACE LOW SULPHUR LIGHT
FURNACE LOW SULPHUR LIGHT DYED

Application and Use:

Multi-purpose fuel

Product Description:

A complex mixture of aliphatic, olefinic, naphthenic and aromatic hydrocarbons, and additives.

REGULATORY CLASSIFICATION

WHMIS:

Class B, Division 3: Combustible Liquids.

Class D, Division 2, Subdivision B: Toxic Material

CEPA: CANADIAN ENVIRONMENTAL PROTECTION ACT

All components of this product are either on the Domestic Substances List (DSL) or are exempt.

TDG INFORMATION (RAIL/ROAD):

Shipping Name: FUEL OIL

Class: 3

Packing Group: III

PIN Number: UN1202

Marine Pollutant:N

Please be aware that other regulations may apply.

TELEPHONE NUMBERS MANUFACTURER/SUPPLIER:

Emergency 24 hr. (519) 339-2145 IMPERIAL OIL
Technical Info. (800) 268-3183 Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(416) 9684441

2. REGULATED COMPONENTS

The following components are defined in accordance with sub-paragraph 13(a) (i) to (iv) or paragraph 14(a) of the Hazardous Products Act:

NAME % CAS #

Kerosene, straight run 0-100 V/V 8008-20-6 LD50:>5g/kg,oral,rat

Light Atmospheric Gas Oil 0-100 V/V 64741-44-2

Light Hydrocracked Distillate 0-100 V/V 64741-77-1

3. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State: Liquid

Specific gravity: not available

Viscosity: 1.70 cSt at 40 deg C

Vapour Density: not available

Boiling Point: 180 to 320 deg C

Evaporation rate: <1 (1= n-butylacetate)

Solubility in water: negligible

Freezing/Pour Point: -39 deg C ASTM D97

Odour Threshold: not available

Vapour Pressure: <1 kPa at 38 deg C

Density: 0.85 g/cc at 15 deg C

Appearance/odour: White or pale yellow liquid, petroleum odour

4. HEALTH HAZARD INFORMATION

NATURE OF HAZARD

INHALATION:

Negligible hazard at normal temperatures (up to 38 deg C).

High vapour concentrations are irritating to the eyes, nose, throat and lungs; may cause headaches and dizziness; may be anesthetic and may cause other central nervous system effects.

Avoid breathing vapours or mists.

EYE CONTACT:

Slightly irritating, but will not injure eye tissue.

SKIN CONTACT:

Low toxicity.

Irritating.

INGESTION:

Low toxicity.

Small amounts of this liquid drawn into the lungs from swallowing or vomiting may cause severe health effects (e.g. bronchopneumonia or pulmonary edema).

CHRONIC:

Lifetime skin painting tests indicate that materials of similar composition have produced skin cancer in experimental animals. The relationship of these results to humans has not been fully established.

ACUTE TOXICITY DATA:

Based on animal testing data from similar materials and products, the acute toxicity of this product is expected to be:

Oral : LD50 > 5000 mg/kg (Rat)

Dermal : LD50 > 2000 mg/kg (Rabbit)

Inhalation : LC50 > 2500 mg/m3 (Rat)

OCCUPATIONAL EXPOSURE LIMIT:

ACGIH recommends:

ACGIH recommends a TWA of 100 mg/m3 total hydrocarbon for diesel fuel

Local regulated limits may vary.

5. FIRST AID MEASURES

INHALATION:

In emergency situations use proper respiratory protection to immediately remove the affected victim from exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.

EYE CONTACT:

Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:

Immediately flush with large amounts of water. Use soap if available. Remove contaminated clothing, including shoes, after flushing has begun. If irritation persists, seek medical attention.

INGESTION:

DO NOT induce vomiting since it is important that no amount of the material should enter the lungs (aspiration). Keep at rest. Get prompt medical attention.

6. PREVENTIVE AND CORRECTIVE MEASURES

PERSONAL PROTECTION:

The selection of personal protective equipment varies, depending upon conditions of use.

In open systems where contact is likely, wear safety goggles, chemical-resistant overalls, and chemically impervious gloves.

Where only incidental contact is likely, wear safety goggles, long sleeves, and chemical-resistant gloves.

Where concentrations in air may exceed the occupational exposure limits given in Section 4 and where engineering, work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent overexposure by inhalation.

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces.

HANDLING, STORAGE AND SHIPPING:

Keep containers closed. Handle and open containers with care.

Store in a cool, well ventilated place away from incompatible materials.

In keeping with good personal hygiene practices, wash hands thoroughly after handling the material.

Do not handle or store near an open flame, sources of heat, or sources of ignition.

Material will accumulate static charges which may cause a spark. Static charge build-up could become an ignition source. Use proper relaxation and grounding procedures.

Empty containers may contain product residue. Do not pressurize, cut, heat, or weld empty containers. Do not reuse empty containers without commercial cleaning or reconditioning.

LAND SPILL:

Eliminate source of ignition. Keep public away. Prevent additional discharge of material, if possible to do so without hazard.

Prevent spills from entering sewers, watercourses or low areas. Contain spilled liquid with sand or earth. Do not use combustible materials such as sawdust.

Recover by pumping (use an explosion proof motor or hand pump), or by using a suitable absorbent.

Consult an expert on disposal of recovered material. Ensure disposal in

compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill.

WATER SPILL:

Remove from surface by skimming or with suitable absorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in unconfined waters.

Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately.

Take all additional action necessary to prevent and remedy the adverse effects of the spill.

7. FIRE AND EXPLOSION HAZARD

Flashpoint and method: 40 deg C PMCC ASTM D93

Autoignition: NA Flammable Limits: LEL: NA UEL: NA

GENERAL HAZARDS:

Combustible Liquid; may form combustible mixtures at or above the flash point.

Toxic gases will form upon combustion.

Static Discharge; material may accumulate static charges which may cause a fire.

FIRE FIGHTING:

Use water spray to cool fire exposed surfaces and to protect personnel.

Shut off fuel to fire.

Use foam, dry chemical or water spray to extinguish fire.

Respiratory and eye protection required for fire fighting personnel.

Avoid spraying water directly into storage containers due to danger of boilover.

A self-contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA may not be required.

HAZARDOUS COMBUSTION PRODUCTS:

Smoke, carbon monoxide, carbon dioxide, oxides of sulphur.

In addition, small amounts of nitrogen oxides will be formed.

8. REACTIVITY DATA

STABILITY:

This product is stable. Hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

Strong oxidizing agents. Use product with caution around heat, sparks, pilot lights, static electricity and open flames.

HAZARDOUS DECOMPOSITION:

None

9. NOTES

All components of this product are listed on the U.S. TSCA inventory.

REVISED.

10. PREPARATION

Date Prepared: November 06, 2002

Prepared by: Lubricants & Specialties

IMPERIAL OIL

Products Division

111 St Clair Avenue West

Toronto, Ontario

M5W 1K3

(800) 268-3183

PROPANE - COMMERCIAL GRADE

TRADE NAME: Propane; Liquefied Petroleum Gas**CHEMICAL NAME:** Propane**SYNONYMS:** LPG; Petroleum Gases, Liquefied**FORMULA:** C₃H₈**CHEMICAL FAMILY:** Aliphatic Hydrocarbon**MOLECULAR WEIGHT:** 44.11**PRODUCT USE:** Various**PRODUCT IDENTIFICATION NUMBER:** UN 1075, Liquefied petroleum gases**HAZARDOUS INGREDIENTS**

CHEMICAL ID	CONCENTRATION	CAS #	LD(50)	LC(50)
Propane	90% - 99.0%	74-98-6	None	None
Ethane	0% - 5.0%	74-84-0	None	None
Isobutane	0% - 2.5%	75-28-5	None	None
Propylene	0% - 5.0%	115-07-1	None	None
Ethyl Mercaptan (Odourant)	0.5 ppm	75-08-1		

PHYSICAL DATA**PHYSICAL STATE:** Liquid and gas under pressure**APPEARANCE:** Colorless gas and liquid**ODOR:** Commercial grade propane has an odourant added which is commonly ethyl mercaptan, which has an odour similar to boiling cabbage.**ODOR THRESHOLD:** Not applicable**SPECIFIC GRAVITY (H₂O = 1):** 0.51**VAPOR PRESSURE:** @ 15°C - 740 kPa**VAPOR DENSITY (air = 1):** 1.56**EVAPORATION RATE:** Not applicable, (gas)**BOILING POINT:** -42.04°C**FREEZING POINT:** -187.68°C**pH:** Unknown**GAS DENSITY:** 1.85 kg/m³ @ 15°C, 101.3 kPa**COEFFICIENT OF WATER/OIL DISTRIBUTION:** 20°C, Bunsen Coefficient = 0.039**FIRE OR EXPLOSION HAZARD**

CONDITIONS OF FLAMMABILITY:	Flammable over a specific range in air
MEANS OF EXTINCTION:	Water, carbon dioxide, dry chemical. "Stop flow of gas before extinguishing fire".
FLASHPOINT AND METHOD OF DETERMINATION:	-104°C cc
UPPER EXPLOSION LIMIT (% BY VOL):	9.5
LOWER EXPLOSION LIMIT (% BY VOL):	2.2
AUTO-IGNITION TEMPERATURE:	480°C
FLAMMABILITY CLASSIFICATION:	Class 1, Group D

HAZARDOUS COMBUSTION PRODUCTS: None
EXPLOSION DATA: Yes in air or oxidizers
SENSITIVITY TO STATIC DISCHARGE: Yes

REACTIVITY DATA

CHEMICAL STABILITY: Stable
INCOMPATIBLE MATERIALS: Oxygen or other oxidizers
CONDITIONS OF REACTIVITY: Heat and air or oxygen
HAZARDOUS DECOMPOSITION PRODUCTS: None

TOXICOLOGICAL PROPERTIES

ROUTES OF ENTRY:

SKIN CONTACT: Contact with the rapidly evaporating liquid could cause frostbite or cryogenic "burns".

SKIN ABSORPTION: None

EYE: See Skin Contact, above

INHALATION: Moderate concentrations so as to exclude an adequate supply of oxygen to the lungs causes dizziness, drowsiness, and eventual unconsciousness. It is also a narcotic which acts as a depressant on the central nervous system.

INGESTION: None

ACUTE OVER EXPOSURE EFFECTS: Breathing high concentrations causes a narcotic effect; however, the major property is the exclusion of an adequate supply of oxygen to the lungs.

Frostbite effects are a change in color of the skin to gray or white possibly followed by blistering.

CHRONIC OVER EXPOSURE EFFECTS: None

EXPOSURE LIMITS: Propane is defined a simple asphyxiant (ACGIH 2003, TWA = 2500 ppm). Oxygen levels should be maintained at greater than 18 molar percent at normal atmospheric pressure which is equivalent to a partial pressure of 135 mm Hg.

IRRITANCY OF PRODUCT: None

SENSITIZATION TO MATERIAL: None

CARCINOGENICITY, REPRODUCTIVE EFFECTS: None

TERATOGENICITY, MUTAGENICITY: None

TOXICOLOGICALLY SYNERGISTIC PRODUCTS: None

PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT: Plastic or rubber gloves. Safety goggles or glasses. Safety shoes, safety shower, eyewash "fountain".

SPECIFIC ENGINEERING CONTROLS: Propane is noncorrosive and may be used with any common structural material.

LEAK AND SPILL PROCEDURES: EVACUATE ALL PERSONNEL FROM AFFECTED AREA.
Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas

prior to attempting repairs. If leak is on container or container valve, contact the closest Air Liquide Canada location.

Ethyl mercaptan is added to commercial propane as an odourant to aid in the detection of leaks. Odourants are not completely effective warning agents in all cases. Certain odourants are polar and/or chemically reactive and can be depleted by reaction or absorption. People differ in their ability to smell, and the sensitivity to odours generally decreases with age and with impaired physical conditions such as colds or respiratory allergies. Prolonged exposure to odourants can cause olfactory desensitization. Other odours or distractions can also reduce the effectiveness of odourants as warning agents. (Reference: CAN/CGSB-3.14-M88 [7.3 to 7.5])

WASTE DISPOSAL: Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to Air Liquide Canada for proper disposal. For emergency disposal, contact the closest Air Liquide Canada location.

HANDLING PROCEDURES AND EQUIPMENT: USE ONLY IN WELL-VENTILATED AREAS.

Valve protection caps must remain in place unless container is secured with valve outlet piped to the point of use. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting to lower pressure piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Do not tamper with (valve) safety device. Close valve after each use and when empty.

STORAGE REQUIREMENTS: Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of non combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 52°C. Cylinders must be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time. Post "No Smoking or Open Flames" signs in the storage or use area. There should be no sources of ignition in the storage or use area.

TDG CLASSIFICATION: 2.1

WHMIS CLASSIFICATION: A, B1

SPECIAL SHIPPING INFORMATION: Always secure cylinders in an upright position before transporting them. NEVER transport cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cylinders secured in open flatbed or in open pick-up type vehicles.

FIRST AID MEASURES

SPECIFIC FIRST AID PROCEDURES: PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO PROPANE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARD.

INHALATION: Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given assisted resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

EYE CONTACT: Flush contaminated eye(s) with copious quantities of water. Part eyelids to assure complete flushing. Continue for a minimum of 15 minutes.

SKIN CONTACT: Dermal Contact or Frostbite: Remove contaminated clothing and flush affected areas with lukewarm water. DO NOT USE HOT WATER. A physician should see the patient promptly if the cryogenic "burn" has resulted in blistering of the dermal surface or deep tissue freezing.

AVIATION FUEL – JET B

SYNONYMS: WIDE BOILING RANGE AVIATION TURBINE FUEL

PRODUCT USE: Fuel

MSDS Number: 141-012

MANUFACTURER TELEPHONE NUMBERS

Shell Canada Limited Shell Emergency Number 1-800-661-7378

P.O. Box 100, Station M **CANUTEC 24 HOUR EMERGENCY NUMBER** 613-996-6666

400-4th Ave. S.W.

Calgary, AB Canada For general information: 1-800-661-1600

T2P 2H5 For MSDS information:

(From 7:30 to 4:30 Mountain Time)

403-691-3982

403-691-2220

This MSDS was prepared by the Toxicology and Material Safety Section of Shell Canada Limited.

*An asterisk in the product name designates a trade-mark(s) of Shell Canada Limited, used under license by Shell Canada Products.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component Name CAS Number %

Range

WHMIS Controlled CBI Claim No.

CBI Date

Naphtha (Petroleum), Full-range

Reformed

68919-37-9 >95 Yes

Benzene 71-43-2 0.5 - 1.5 Yes

See Section 8 for Occupational Exposure Guidelines.

3. HAZARDS IDENTIFICATION

Physical Description: Liquid Bright Clear Typical Gasoline Odour

Page 1 of 7

SHELL JET B 141-012

Revision Number: 8

Routes of Exposure: Exposure may occur via inhalation, ingestion, skin absorption and skin or eye contact.

Hazards:

Flammable Liquid.

Irritating to skin.

Contains Benzene.

May cause cancer.

Vapours are moderately irritating to the eyes.

Vapours are moderately irritating to the respiratory passages. The liquid when accidentally aspirated into the lungs can cause a severe inflammation of the lung.

Excessive exposure to benzene may cause leukemia in man.

Handling: Eliminate all ignition sources.

Wear suitable gloves and eye protection.

Bond and ground transfer containers and equipment to avoid static accumulation.

Avoid prolonged exposure to vapours.

Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.

For further information on health effects, see Section 11.

4. FIRST AID

Eyes Flush eyes with water for at least 15 minutes while holding eyelids open. If irritation occurs and persists, obtain medical attention.

Skin Wash contaminated skin with mild soap and water for 15 minutes. If irritation occurs and persists, obtain medical attention.

Ingestion DO NOT INDUCE VOMITING! OBTAIN MEDICAL ATTENTION IMMEDIATELY.

Guard against aspiration into lungs by having the individual turn on to their left side. If vomiting occurs spontaneously keep head below hips to prevent aspiration

of liquid into the lungs.

Inhalation Remove victim from further exposure and restore breathing, if required. Obtain medical attention.

Notes to Physician The main hazard following accidental ingestion is aspiration of the liquid into the lungs producing chemical pneumonitis. If more than 2.0 mL/kg has been ingested, vomiting should be induced with supervision. If symptoms such as loss of gag reflex, convulsions or unconsciousness occur before vomiting, gastric lavage with a cuffed endotracheal tube should be considered.

5. FIRE FIGHTING MEASURES

Extinguishing Media Dry Chemical

Carbon Dioxide

Foam

Water Fog

Page 2 of 7

SHELL JET B 141-012

Revision Number: 8

Firefighting Instructions Extremely flammable. Vapour forms a flammable/explosive mixture with air between upper and lower flammable limits. Vapours may travel along ground and flashback along vapour trail may occur. Do not use water except as a fog. Use water to cool fire exposed containers. Product will float and can be reignited on surface of water. Containers exposed to intense heat from fires should be cooled with water to prevent vapour pressure buildup which could result in container rupture. Container areas exposed to direct flame contact should be cooled with large quantities of water as needed to prevent weakening of container structure. Always stay away from ends of containers due to explosive potential. Fight fire from maximum distance. Do not enter confined fire space without adequate protective clothing and an approved positive pressure self-contained breathing apparatus.

Hazardous Combustion

Products

A complex mixture of airborne solid, liquid, particulates and gases will evolve when this material undergoes pyrolysis or combustion. Carbon dioxide, carbon monoxide and unidentified organic compounds may be formed upon combustion.

6. ACCIDENTAL RELEASE MEASURES

Issue warning "Flammable". Eliminate all ignition sources. Handling equipment must be grounded. Isolate hazard area and restrict access. Try to work upwind of spill. Avoid direct contact with material. Saturated clothing should be immediately removed to avoid flammability hazard. Wear appropriate breathing apparatus (if applicable) and protective clothing. Stop leak only if safe to do so. Dike and contain land spills; contain water spills by booming. Use water fog to knock down vapours; contain runoff. For large spills remove by mechanical means and place in containers. Absorb residue or small spills with absorbent material and remove to non-leaking containers for disposal. Recommended materials: Clay or Sand Flush area with water to remove trace residue. Dispose of recovered material as noted under Disposal Considerations. Notify appropriate environmental agency(ies).

7. HANDLING AND STORAGE

Handling: Extremely flammable. Avoid excessive heat, sparks, open flames and all other sources of ignition. Fixed equipment as well as transfer containers and equipment should be grounded to prevent accumulation of static charge. Vapours are heavier than air and will settle and collect in low areas and pits, displacing breathing air. Extinguish pilot lights, cigarettes and turn off other sources of ignition prior to use and until all vapours are gone. Vapours may accumulate and travel to distant ignition sources and flashback. Do not cut, drill, grind, weld or perform similar operations on or near containers. Empty containers are hazardous, may contain flammable/explosive dusts, residues or vapours. Do not pressurize drum containers to empty them. Never siphon by mouth. Wash with soap and water prior to eating, drinking, smoking, applying cosmetics or using toilet facilities. Launder contaminated clothing prior to reuse. Use good personal hygiene.

Storage: Use explosion-proof ventilation to prevent vapour accumulation. Keep container tightly

closed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

THE FOLLOWING INFORMATION, WHILE APPROPRIATE FOR THIS PRODUCT, IS GENERAL IN NATURE. THE SELECTION OF PERSONAL PROTECTIVE EQUIPMENT WILL VARY DEPENDING ON

SHELL JET B 141-012

Revision Number: 8

THE CONDITIONS OF USE.

Occupational Exposure

Limits (2000) :

North American exposure limits have not been established for the product.

Consult local authorities for acceptable provincial values.

Gasoline: 300 ppm (STEL: 500 ppm)

Benzene (skin) : 0.5 ppm (STEL: 2.5 ppm)

Mechanical Ventilation: Make up air should always be supplied to balance air exhausted (either generally or locally). Concentrations in air should be maintained below lower explosive limit at all times or below the recommended threshold limit value if unprotected personnel are involved. For personnel entry into confined spaces (i.e. bulk storage tanks) a proper confined space entry procedure must be followed including ventilation and testing of tank atmosphere. Use explosion-proof ventilation as required to control vapour concentrations.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Chemical safety goggles and/or full face shield to protect eyes and face, if product is handled such that it could be splashed into eyes. Provide an eyewash station in the area.

Skin Protection: Impervious gloves (viton, nitrile) should be worn at all times when handling this material. In confined spaces or where the risk of skin exposure is much higher, impervious clothing should be worn. Safety showers should be available for emergency use.

Respiratory Protection: If exposure exceeds occupational exposure limits, use an appropriate NIOSH-approved respirator. Use a NIOSH-approved chemical cartridge respirator with organic vapour cartridges or use a NIOSH-approved supplied-air respirator. For high airborne concentrations, use a NIOSH-approved supplied-air respirator, either self-contained or airline breathing apparatus, operated in positive pressure mode.

9. PHYSICAL DATA

Physical State: Liquid

Appearance: Bright Clear

Odour: Typical Gasoline Odour

Odour Threshold: Not available

Freezing/Pour Point: <-51 degrees C

Boiling Point: 60 - 270 degrees C

Density: 750 - 801 kg/m³ @ 15 degrees C

Vapour Density (Air = 1): Not available

Vapour Pressure: >42 mm Hg @ 38 degrees C

Specific Gravity (Water = 1): 0.000

pH: Not applicable

Flash Point: Method Tag Closed Cup = -23 - 1 degrees C

Lower Explosion Limit: 1.4 % (vol.)

Upper Explosion Limit: 7.6 % (vol.)

Autoignition Temperature: Not available

Viscosity: Not available

Evaporation Rate (n-BuAc = 1): Not available

Partition Coefficient (KOW): Not available

Water Solubility: Insoluble

Other Solvents: Hydrocarbon Solvents

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Revision Number: 8

10. STABILITY AND REACTIVITY

Chemically Stable: Yes

Hazardous Polymerization: No

Sensitive to Mechanical Impact: No

Sensitive to Static Discharge: Yes

Hazardous Decomposition Products: Thermal decomposition products are highly dependent on combustion conditions.

Incompatible Materials: Avoid contact with strong oxidizing agents and acids.

Conditions of Reactivity: Avoid excessive heat, open flames and all ignition sources.

11. TOXICOLOGICAL INFORMATION

Ingredient (or Product if not specified) Toxicological Data

Naphtha (Petroleum), Full-range Reformed LD50 Oral Rat >28 mL/kg

Benzene LD50 Oral Rat = 930 - 5600 mg/kg

LC50 Inhalation Rat = 13700 ppm for 4 hours

Routes of Exposure: Exposure may occur via inhalation, ingestion, skin absorption and skin or eye contact.

Irritancy: This product is expected to be irritating to skin but is not predicted to be a skin sensitizer.

Chronic Effects: Prolonged and repeated contact with skin can cause defatting and drying of the skin resulting in skin irritation and dermatitis. Prolonged exposure to high vapour concentration can cause headache, dizziness, nausea, blurred vision and central nervous system depression. Prolonged and repeated exposure may cause serious injury to blood forming organs, resulting in anemia and similar conditions.

Pre-existing Conditions: Pre-existing eye, skin and respiratory disorders may be aggravated by exposure to this product.

Carcinogenicity and

Mutagenicity:

This product contains benzene. Epidemiological studies indicate that long term inhalation of benzene vapour can cause leukaemia in man. Benzene has also produced chromosomal aberrations in peripheral blood lymphocytes. Carcinogenic hazard.

12. ECOLOGICAL INFORMATION

Environmental Effects Do not allow product or runoff from fire control to enter storm or sanitary sewers, lakes, rivers, streams, or public waterways. Block off drains and ditches. Provincial regulations require and federal regulations may require that environmental and/or other agencies be notified of a spill incident. Spill area must be cleaned and restored to original condition or to the satisfaction of authorities. May be harmful to aquatic life. May cause physical fouling of aquatic organisms.

Biodegradability Not readily biodegradable. Potential for bioaccumulation.

13. DISPOSAL CONSIDERATIONS

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Revision Number: 8

Waste management priorities (depending on volumes and concentration of waste) are: 1. recycle (reprocess), 2. energy recovery (cement kilns, thermal power generation), 3. incineration, 4. disposal at a licenced waste disposal facility. Do not attempt to combust waste on-site. Incinerate at a licenced waste disposal site with approval of environmental authority.

14. TRANSPORTATION INFORMATION

Canadian Road and Rail Shipping Classification:

UN/NA Number UN1863

Proper Shipping Name FUEL, AVIATION, TURBINE ENGINE

Hazard Class Class 3 Flammable Liquids

Packing Group PG II

Shipping Description FUEL, AVIATION, TURBINE ENGINE Class 3 UN1863 PG II

15. REGULATORY INFORMATION

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

WHMIS Class: Class B2 Flammable Liquid

Class D2B Other Toxic Effects - Skin Irritant

Class D2A Other Toxic Effects - Carcinogen

DSL/NDSL Status: This product, or all components, are listed on the Domestic Substances List, as required under the Canadian Environmental Protection Act. This product and/or all components are listed on the U.S. EPA TSCA Inventory.

Other Regulatory Status: No Canadian federal standards.

16. ADDITIONAL INFORMATION

LABEL STATEMENTS

Hazard Statement :

Flammable Liquid.

Irritating to skin.

Contains Benzene.

May cause cancer.

Handling Statement: Eliminate all ignition sources.

Wear suitable gloves and eye protection.

Bond and ground transfer containers and equipment to avoid static accumulation.

Avoid prolonged exposure to vapours.

Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.

First Aid Statement : Wash contaminated skin with soap and water.

Flush eyes with water.

If overcome by vapours remove to fresh air.

Do not induce vomiting.

Obtain medical attention.

REGULAR UNLEADED GASOLINE

MSDS: 2655

Revision #: 34 **Revision Date:** 3/31/2003

Product Number(s): CPS201000 [See Section 16 for Additional Product Numbers]

Synonyms: Calco Regular Unleaded Gasoline

Company Identification

Chevron Products Company

Marketing, MSDS Coordinator

6001 Bollinger Canyon Road

San Ramon, CA 94583

United States of America

Transportation Emergency Response

CHEMTREC: (800) 424-9300 or (703) 527-3887

Health Emergency

ChevronTexaco Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623

Product Information

Technical Information: (510) 242-5357

SPECIAL NOTES: This MSDS applies to: Federal Reformulated Gasoline, California Reformulated Gasoline, Wintertime Oxygenated Gasoline, Low RVP Gasoline and Conventional Gasoline.

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS

CAS NUMBER

AMOUNT

Motor gasoline is considered a mixture by EPA under the Toxic Substances Control Act (TSCA). The refinery streams used to blend motor gasoline are all on the TSCA Chemical Substances Inventory. The appropriate CAS number for refinery blended motor gasoline is 86290-81-5. The product specifications of motor gasoline sold in your area will depend on applicable Federal and State regulations.

EMERGENCY OVERVIEW

- EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE
- HARMFUL OR FATAL IF SWALLOWED - MAY CAUSE LUNG DAMAGE IF SWALLOWED
- VAPOR HARMFUL
- CAUSES SKIN IRRITATION
- CAUSES EYE IRRITATION

- LONG-TERM EXPOSURE TO VAPOR HAS CAUSED CANCER IN LABORATORY ANIMALS
- KEEP OUT OF REACH OF CHILDREN
- TOXIC TO AQUATIC ORGANISMS

IMMEDIATE HEALTH EFFECTS

Eye: Contact with the eyes causes irritation. Symptoms may include pain, tearing, reddening, swelling and impaired vision.

Skin: Contact with the skin causes irritation. Skin contact may cause drying or defatting of the skin. Symptoms may include pain, itching, discoloration, swelling, and blistering. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death.

Inhalation: The vapor or fumes from this material may cause respiratory irritation. Symptoms of respiratory irritation may include coughing and difficulty breathing. Breathing this material at concentrations above the recommended exposure limits may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

Gasoline 86290-81-5 100 %volume

Benzene 71-43-2 0.1 - 4.9 %volume

Ethyl benzene 100-41-4 0.1 - 3 %volume

Naphthalene 91-20-3 0.1 - 2 %volume

Ethanol 64-17-5 0 - 10 %volume

Methyl tert-butyl ether (MTBE) 1634-04-4 0 - 15 %volume

Tertiary amyl methyl ether (TAME) 994-05-8 0 - 17 %volume

Ethyl tert-butyl ether (ETBE) 637-92-3 0 - 18 %volume

SECTION 3 HAZARDS IDENTIFICATION

DELAYED OR OTHER HEALTH EFFECTS:

Reproduction and Birth Defects: This material is not expected to cause birth defects or other harm to the developing fetus based on animal data.

Cancer: Prolonged or repeated exposure to this material may cause cancer. Gasoline has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains benzene, which has been classified as a carcinogen by the National Toxicology Program (NTP) and a Group 1 carcinogen (carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains ethylbenzene which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains naphthalene, which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Whole gasoline exhaust has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Risk depends on duration and level of exposure. See Section 11 for additional information.

Eye: Flush eyes with water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get medical attention if irritation persists.

Skin: Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.

Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

See Section 7 for proper handling and storage.

FIRE CLASSIFICATION:

OSHA Classification (29 CFR 1910.1200): Flammable liquid.

NFPA RATINGS: Health: 1 Flammability: 3 Reactivity: 0

FLAMMABLE PROPERTIES:

Flashpoint: (Tagliabue Closed Cup) < -45 °C (< -49 °F)

Autoignition: > 280 °C (> 536 °F)

Flammability (Explosive) Limits (% by volume in air): Lower: 1.4 Upper: 7.6

EXTINGUISHING MEDIA: Dry Chemical, CO₂, AFFF Foam or alcohol resistant foam if >15% volume polar solvents (oxygenates).

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: Use water spray to cool fire-exposed containers and to protect personnel. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be

SECTION 4 FIRST AID MEASURES

SECTION 5 FIRE FIGHTING MEASURES

evolved when this material undergoes combustion.

Protective Measures: Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying noncombustible

absorbent materials or pumping. All equipment used when handling the product must be grounded.

A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required. This material is covered by EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Petroleum Exclusion. Therefore, releases to the environment may not be reportable under CERCLA.

Precautionary Measures: READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL. This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Never siphon gasoline by mouth.

Use only as a motor fuel. Do not use for cleaning, pressure appliance fuel, or any other such use. Do not store in open or unlabeled containers. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe vapor or fumes. Wash thoroughly after handling. Keep out of the reach of children.

Unusual Handling Hazards: WARNING! Do not use as portable heater or appliance fuel. Toxic fumes may accumulate and cause death.

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'. Improper filling of portable gasoline containers creates danger of fire. Only dispense gasoline into approved and properly labeled gasoline containers. Always place portable containers on the ground. Be sure pump nozzle is in contact with the container while filling. Do not use a nozzle's lock-open device. Do not fill portable containers that are inside a vehicle or truck/trailer bed.

General Storage Information: DO NOT USE OR STORE near heat, sparks or open flames. USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 6 ACCIDENTAL RELEASE MEASURES

SECTION 7 HANDLING AND STORAGE

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Chlorinated Polyethylene (or Chlorosulfonated Polyethylene), Nitrile Rubber, Polyurethane, Viton.

Respiratory Protection: Determine if airborne concentrations are below the recommended exposure limits. If not, wear an approved respirator that provides adequate protection from measured concentrations of this material, such as: Air-Purifying Respirator for Organic Vapors.

When used as a fuel, this material can produce carbon monoxide in the exhaust. Determine if airborne concentrations are below the occupational exposure limit for carbon monoxide. If not, wear an approved positive pressure air-supplying respirator.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component

Limit

TWA

STEL

Ceiling

Notation

Benzene

ACGIH_TLV 5 ppm 2.5 ppm Skin A1 Benzene

OSHA_PEL 1 ppm 5 ppm Benzene

OSHA_Z210 ppm 25 ppm Ethanol

ACGIH_TLV 1000 ppm A4 Ethanol

OSHA_PEL

1000 ppm

Ethyl benzene

ACGIH_TLV

100 ppm

125 ppm

A3

Ethyl benzene

OSHA_PEL

100 ppm

125 ppm

Ethyl tert-butyl ether (ETBE)

ACGIH_TLV

5 ppm

Gasoline

ACGIH_TLV

300 ppm

500 ppm

A3

Gasoline

OSHA_PEL

300 ppm

500 ppm

Refer to the OSHA Benzene Standard (29 CFR 1910.1028) and Table Z-2 for detailed training, exposure monitoring, respiratory protection and medical surveillance requirements before using this product.

Attention: the data below are typical values and do not constitute a specification.

Color: Colorless to yellow

Physical State: Liquid

Odor: Petroleum odor

pH: NA

Vapor Pressure: 5 psi - 15 psi (Typical) @ 37.8°C (100°F)

Vapor Density (Air = 1): 3 - 4 (Typical)

Boiling Point: 37.8°C (100°F) - 204.4°C (400°F) (Typical)

Solubility: Insoluble in water; miscible with most organic solvents.

Freezing Point: NA

Melting Point: NA

Specific Gravity: 0.7 g/ml - 0.8 g/ml @ 15.6°C (60.1°F)

Viscosity: <1 SUS @ 37.8 °C (100°F)

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Incompatibility With Other Materials: May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Hazardous Decomposition Products: None known (None expected)

Hazardous Polymerization: Hazardous polymerization will not occur.

IMMEDIATE HEALTH EFFECTS

Eye Irritation: The Draize eye irritation mean score in rabbits for a 24-hour exposure was: 0/110.

Skin Irritation: For a 4-hour exposure, the Primary Irritation Index (PII) in rabbits is: 4.8/8.0.

Skin Sensitization: This material did not cause sensitization reactions in a Modified Buehler guinea pig test.

Acute Dermal Toxicity: 24 hour(s) LD50: >3.75g/kg (rabbit).

Acute Oral Toxicity: LD50: >5 ml/kg (rat)

Acute Inhalation Toxicity: 4 hour(s) LD50: >2000ppm (rat).

ADDITIONAL TOXICOLOGY INFORMATION:

Gasolines are highly volatile and can produce significant concentrations of vapor at ambient temperatures.

Gasoline vapor is heavier than air and at high concentrations may accumulate in confined spaces to present both

Methyl tert-butyl ether (MTBE)

ACGIH_TLV

50 ppm

A3

Naphthalene

ACGIH_TLV

10 ppm

15 ppm

Skin A4

Naphthalene

OSHA_PEL

10 ppm

15 ppm

Tertiary amyl methyl ether (TAME)

CHEVRON

50 ppm

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

SECTION 10 STABILITY AND REACTIVITY

SECTION 11 TOXICOLOGICAL INFORMATION

safety and health hazards. When vapor exposures are low, or short duration and infrequent, such as during refuelling and tanker loading/unloading, neither total hydrocarbon nor components such as benzene are likely to result in any adverse health effects. In situations such as accidents or spills where exposure to gasoline vapor is potentially high, attention should be paid to potential toxic effects of specific components. Information about specific components in gasoline can be found in Sections 2, 8 and 15 of this MSDS. More detailed information on the health hazard of specific gasoline components can be obtained calling the Chevron Emergency Information Center (see Section 1 for phone numbers).

NEUROTOXICITY: Pathological misuse of solvents and gasoline, involving repeated and prolonged exposure to high concentrations of vapor is a significant exposure on which there are many reports in the medical

literature. As with other solvents, persistent abuse involving repeated and prolonged exposures to high concentrations of vapor has been reported to result in central nervous system damage and eventually, death. In a study in which ten human volunteers were exposed for 30 minutes to approximately 200, 500 or 1000 ppm concentrations of gasoline vapor, irritation of the eyes was the only significant effect observed, based on both subjective and objective assessments. In an inhalation study, groups of 6 Fischer rats (3 male, 3 female) were exposed to 2056 ppm of wholly vaporized unleaded gasoline for 6 hours per day, 5 days per week for up to 18 months. Histopathology of the peripheral nervous system and spinal cord revealed no distal axonal neuropathy of the type associated with exposure to n-hexane even though gasoline contained 1.9% n-hexane. The authors concluded that gasoline treatment may have amplified the incidence and prominence of some naturally occurring age-related (subclinical) in the nervous system. **BIRTH DEFECTS AND REPRODUCTIVE TOXICITY:** An inhalation study with rats exposed to 0, 400 and 1600 ppm of wholly vaporized unleaded gasoline, 6 hours per day on day 6 through 16 of gestation, showed no teratogenic effects nor indication of toxicity to either the mother or the fetus. Another inhalation study in rats exposed to 3000, 6000, or 9000 ppm of gasoline vapor, 6 hours per day on day 6 through 20 of gestation, also showed no teratogenic effects nor indications of toxicity to either the mother or the fetus.

CHRONIC TOXICITY/CANCER: Wholly vaporized unleaded gasoline was used in a 3 month inhalation study. Groups of 40 rats (20 males, 20 female) and 8 squirrel monkeys (4 male, 4 female) were exposed 6 hours per day and 5 days per week for 13 weeks to 384 or 1552 ppm gasoline. One group of each species served as unexposed controls. The initial conclusion of this study was that inhalation of gasoline at airborne concentrations of up to 1522 ppm caused no toxicity in rats or monkeys. However, further histopathological examination of male rat kidneys on the highest dose group revealed an increased incidence and severity of regenerative epithelium and dilated tubules containing proteinaceous deposits. Lifetime inhalation of wholly vaporized unleaded gasoline at 2056 ppm has caused increased liver tumors in female mice. The mechanism of this response is still being investigated but it is thought to be an epigenetic process unique to the female mouse.

This exposure also caused kidney damage and eventually kidney cancer in male rats. No other animal model studied has shown these adverse kidney effects and there is no physiological reason to believe that they would occur in man. EPA has concluded that mechanism by which wholly vaporized unleaded gasoline causes kidney damage is unique to the male rat. The effects in that species (kidney damage and cancer) should not be used in human risk assessment. In their 1988 review of carcinogenic risk from gasoline, The International Agency for Research on Cancer (IARC) noted that, because published epidemiology studies did not include any exposure data, only occupations where gasoline exposure may have occurred were reviewed. These included gasoline service station attendants and automobile mechanics. IARC also noted that there was no opportunity to separate effects of combustion products from those of gasoline itself. Although IARC allocated gasoline a final overall classification of Group 2B, i.e. possibly carcinogenic to humans, this was based on limited evidence in experimental animals plus supporting evidence including the presence in gasoline of benzene and 1, 3-butadiene. The actual evidence for carcinogenicity in humans was considered inadequate.

MUTAGENICITY: Gasoline was not mutagenic, with or without activation, in the Ames assay (*Salmonella typhimurium*), *Saccharomyces cerevisiae*, or mouse lymphoma assays. In addition, point mutations were not induced in human lymphocytes. Gasoline was not mutagenic when tested in the mouse dominant lethal assay. Administration of gasoline to rats did not cause chromosomal aberrations in their bone marrow cells.

EPIDEMIOLOGY: To explore the health effects of workers potentially exposed to gasoline vapors in the marketing and distribution sectors of the petroleum industry, the American Petroleum Institute sponsored a cohort mortality study (Publication 4555), a nested case-control study (Publication 4551), and an exposure assessment study (Publication 4552). Histories of exposure to gasoline were reconstructed for cohort of more than 18,000 employees from four companies for the time period between 1946 and 1985. The results of the cohort mortality study indicated that there was no increased mortality from either kidney cancer or leukemia among marketing and marine distribution employees who were exposed to gasoline in the petroleum industry, when compared to the general population. More importantly, based on internal comparisons, there was no association between mortality from kidney cancer or leukemia and various indices of gasoline exposure. In particular, neither duration of employment, duration of exposure, age at first exposure, year of first exposure, job category, cumulative exposure, frequency of peak exposure, nor average intensity of exposure had any effect on kidney cancer or leukemia mortality. The results of the nested case-control study confirmed the findings of the original cohort study. That is, exposure to gasoline at the levels experienced by this cohort of distribution workers is not a significant risk factor for leukemia (all cell types), acute myeloid leukemia, kidney cancer or multiple myeloma.

ECOTOXICITY

The 96 hour(s) LC50 for rainbow trout (*Oncorhynchus mykiss*) is 2.7 mg/l.

The 48 hour(s) LC50 for water flea (*Daphnia magna*) is 3.0 mg/l.

The 96 hour(s) LC50 for sheepshead minnow (*Cyprinodon variegatus*) is 8.3 mg/l.

The 96 hour(s) LC50 for mysid shrimp (*Mysidopsis bahia*) is 1.8 mg/l.

This material is expected to be toxic to aquatic organisms. Gasoline studies have been conducted in the

laboratory under a variety of test conditions with a range of fish and invertebrate species. An even more extensive database is available on the aquatic toxicity of individual aromatic constituents. The majority of published studies do not identify the type of gasoline evaluated, or even provide distinguishing characteristics such as aromatic content or presence of lead alkyls. As a result, comparison of results among studies using open and closed vessels, different ages and species of test animals and different gasoline types, is difficult. The bulk of the available literature on gasoline relates to the environmental impact of monoaromatic (BTEX) and diaromatic (naphthalene, methylnaphthalenes) constituents. In general, non-oxygenated gasoline exhibits some short-term toxicity to freshwater and marine organisms, especially under closed vessel or flow-through exposure conditions in the laboratory. The components which are the most prominent in the water soluble fraction and cause aquatic toxicity, are also highly volatile and can be readily biodegraded by microorganisms.

ENVIRONMENTAL FATE

This material is expected to be readily biodegradable. Following spillage, the more volatile components of gasoline will be rapidly lost, with concurrent dissolution of these and other constituents into the water. Factors such as local environmental conditions (temperature, wind, mixing or wave action, soil type, etc), photo-oxidation, biodegradation and adsorption onto suspended sediments, can contribute to the weathering of spilled gasoline. The aqueous solubility of non-oxygenated unleaded gasoline, based on analysis of benzene, toluene, ethylbenzene+xylene and naphthalene, is reported to be 112 mg/l. Solubility data on individual gasoline constituents also available.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Name: GASOLINE

SECTION 12 ECOLOGICAL INFORMATION

SECTION 13 DISPOSAL CONSIDERATIONS

SECTION 14 TRANSPORT INFORMATION

DOT Hazard Class: 3 (Flammable Liquid)

DOT Identification Number: UN1203

DOT Packing Group: II

SARA 311/312 CATEGORIES: 1. Immediate (Acute) Health Effects: YES

2. Delayed (Chronic) Health Effects: YES

3. Fire Hazard: YES

4. Sudden Release of Pressure Hazard: NO

5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

The following components of this material are found on the regulatory lists indicated.

CERCLA REPORTABLE QUANTITIES(RQ)/SARA 302 THRESHOLD PLANNING QUANTITIES(TPQ):

SECTION 15 REGULATORY INFORMATION

4_I1=IARC Group 1

15=SARA Section 313

4_I2A=IARC Group 2A

16=CA Proposition 65

4_I2B=IARC Group 2B

17=MA RTK

05=NTP Carcinogen

18=NJ RTK

06=OSHA Carcinogen

19=DOT Marine Pollutant

09=TSCA 12(b)

20=PA RTK

Benzene

15, 16, 17, 18, 20, 4_I1, 5, 6

Ethanol

17, 18, 20

Ethyl benzene

15, 17, 18, 20, 4_I2B

Gasoline

17, 18, 20

Methyl tert-butyl ether (MTBE)

15, 17, 18, 20, 9

Naphthalene

15, 16, 17, 18, 20, 4_I2B

Tertiary amyl methyl ether (TAME)

9

Component RQ

Component TPQ

Product RQ

CHEMICAL INVENTORIES:

CANADA: All the components of this material are on the Canadian DSL or have been notified under the New Substance Notification Regulations, but have not yet been published in the Canada Gazette.

UNITED STATES: All of the components of this material are on the Toxic Substances Control Act (TSCA)

Chemical Inventory.

WHMIS CLASSIFICATION:

Class B, Division 2: Flammable Liquids

Class D, Division 2, Subdivision A: Very Toxic Material -

Carcinogenicity

Class D, Division 2, Subdivision B: Toxic Material -

Skin or Eye Irritation

NFPA RATINGS: Health: 1 Flammability: 3 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4 -Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

Additional Product Number(s): CPS201023, CPS201054, CPS201055, CPS201075, etc

ETHYLENE GLYCOL - ANTIFREEZE

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: SHELL™ Fully Formulated Phosphate Free Coolant/AF
MSDS NUMBER: 94083E - 0
PRODUCT CODE(S): 94083, 9408300001, 9408300055, 9408310011

MANUFACTURER ADDRESS: SOPS Products, P.O. Box 4427, Houston, TX. 77210-4427

TELEPHONE NUMBERS

Spill Information: (877) 242-7400
Health Information: (877) 504-9351
MSDS Assistance Number: (877) 276-7285

SECTION 2 PRODUCT/INGREDIENTS

CAS#	CONCENTRATION	INGREDIENTS
Coolant/Antifreeze		
107-21-1	90 - 98.99 %weight	Ethylene Glycol
7732-18-5	1 - 4.99 %weight	Deionized water
7632-00-0	< 1 %weight	Sodium Nitrite
1310-73-2	< 1 %weight	Sodium Hydroxide

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance & Odor: Fluorescent green liquid. Mild odor.

Health Hazards: May be harmful or fatal if swallowed. May cause acidosis, cardiopulmonary and kidney effects. May cause CNS depression.

NFPA Rating (Health, Fire, Reactivity): 2, 1, 0

Hazard Rating: Least - 0 Slight - 1 Moderate - 2 High - 3 Extreme - 4

Inhalation:

In applications where vapors (caused by high temperature) or mists (caused by mixing or spraying) are created, breathing may cause a mild burning sensation in the nose, throat and lungs.

Eye Irritation:

If irritation occurs, a temporary burning sensation, minor redness, swelling, and/or blurred vision may result.

Skin Contact:

May cause slight irritation of the skin. If irritation occurs, a temporary burning sensation and minor redness and/or swelling may result. Other adverse effects not expected from brief skin contact.

Ingestion:

May be harmful or fatal if swallowed. Contains ethylene glycol and/or diethylene glycol which are toxic when swallowed. A lethal dose for an adult is 1 ml per kilogram or about 4 ounces (1/2 cup). Severe kidney damage can occur as a result of ingestion. Ingestion may result in nausea, vomiting and abdominal cramps. Metabolic acidosis and cardiopulmonary effects can occur following ingestion. May cause Central Nervous System (CNS) depression.

Other Health Effects:

Refer to Section 11, Toxicological Information, for specific information on the following effects:

Developmental Toxicity

Primary Target Organs:

The following organs and/or organ systems may be damaged by overexposure to this material and/or its components:

Cardiovascular System, Kidney, Liver, Lungs

Signs and Symptoms:

May cause cardiopulmonary effects including rapid respiration and heartbeat, cyanosis and in severe cases, pulmonary edema and pneumonia. Early to moderate CNS depression may be evidenced by giddiness, headache, dizziness and nausea. In extreme cases, unconsciousness and death may occur. Kidney damage may be indicated by changes in urine output or appearance, pain upon urination or in the lower back or general edema (swelling from fluid retention). Liver damage may be indicated by loss of appetite, jaundice (yellowish skin and eye color), fatigue and sometimes pain and swelling in the upper right abdomen.

Aggravated Medical Conditions:

Pre-existing eye, skin, respiratory, liver and kidney disorders and may be aggravated by exposure to this product.

For additional health information, refer to section 11.

SECTION 4 FIRST AID MEASURES

Inhalation:

Move victim to fresh air and provide oxygen if breathing is difficult. Get medical attention.

Skin:

Flush exposed area with water and follow by washing with soap if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment. If skin irritation persists after washing, get medical advice.

Eye:

Flush eyes with plenty of water while holding eyelids open. Rest eyes for 30 minutes. If redness, burning, blurred vision or swelling occur, transport to nearest medical facility for additional treatment. If eye irritation persists, seek medical advice.

Ingestion:

DO NOT take internally. If swallowed, IMMEDIATELY contact a poison control center, emergency treatment center, or physician. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs.

Note to Physician:

IMMEDIATE TREATMENT IS EXTREMELY IMPORTANT! Ethylene Glycol (EG) and Diethylene Glycol (DEG) intoxication may initially produce behavioral changes, drowsiness, vomiting, diarrhea, thirst, and convulsions. EG and DEG are nephrotoxic. End stages of poisoning may include renal damage or failure with acidosis. Supportive measures, supplemented with hemodialysis if indicated, may limit the progression and severity of toxic effects. May cause cardiopulmonary effects. For ETHYLENE GLYCOL POISONING, intravenous ethanol is a recognized antidotal treatment; other antidotal treatments also exist for ethylene glycol poisoning.

SECTION 5 FIRE FIGHTING MEASURES

Flash Point [Method]: >244 °F/>117.78 °C [Closed Cup]

Extinguishing Media:

Prevent run off from fire control or dilution from entering streams, sewers or drinking water supply.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures:

May burn although not readily ignitable.

Wear appropriate personal protective equipment when cleaning up spills. Refer to Section 8.

Spill Management:

Shut off source of leak if safe to do so. Dike and contain spill.

FOR LARGE SPILLS: Remove with vacuum truck or pump to storage/salvage vessels.

FOR SMALL SPILLS: Soak up residue with an absorbent such as clay, sand or other suitable material. Place in non-leaking container and seal tightly for proper disposal.

Reporting:

U.S. regulations require reporting releases of this material to the environment which exceed the reportable quantity to the National Response Center at (800)424-8802.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures:

Do not ingest. Avoid prolonged or repeated contact with eyes, skin or clothing. Avoid breathing of vapors, fumes or mists. Use with adequate ventilation. Wash thoroughly after handling. Avoid heat, open flames, including pilot lights, and strong oxidizing agents. Use explosion-proof ventilation to prevent vapor accumulation. Ground all handling equipment to prevent sparking. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Storage:

Do not store in open or unlabeled containers. Store in a cool, dry place with adequate ventilation. Keep away from open flames and high temperatures.

Container Warnings:

Keep containers closed when not in use. Containers, even those that have been emptied, can contain explosive vapors. Do not cut, drill, grind, weld or perform similar operations on or near containers.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Ethylene Glycol ACGIH TLV Ceiling: 100 mg/m³
Ethylene Glycol OSHA PEL - 1989(revoked) Ceiling: 50 ppmv

EXPOSURE CONTROLS

Provide adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Eye washes and showers for emergency use.

PERSONAL PROTECTION

Personal protective equipment (PPE) selections vary based on potential exposure conditions such as handling practices, concentration and ventilation. Information on the selection of eye, skin and respiratory protection for use with this material is provided below.

Eye Protection:

Chemical Goggles and Face Shield, or Safety glasses with side shields

Skin Protection:

Use protective clothing which is chemically resistant to this material. Selection of protective clothing depends on potential exposure conditions and may include gloves, boots, suits and other items. The selection(s) should take into account such factors as job task, type of exposure and durability requirements.

Published literature, test data and/or glove and clothing manufacturers indicate the best protection is provided by:
Natural rubber, or Neoprene

Respiratory Protection:

If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, an approved respirator must be worn. Respirator selection, use and maintenance should be in accordance with the requirements of the OSHA Respiratory Protection Standard, 29 CFR 1910.134.

Types of respirator(s) to be considered in the selection process include:

For Mist: Air Purifying, R or P style NIOSH approved respirator.

For Vapors: Air Purifying, R or P style prefilter & organic cartridge, NIOSH approved respirator.

Self-contained breathing apparatus for use in environments with unknown concentrations or emergency situations.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance & Odor: Fluorescent green liquid. Mild odor.

Substance Chemical Family: Glycol

Appearance: Fluorescent green liquid.

Boiling Point: > 388 °F

Flash Point: > 244 °F [Closed Cup]

Freezing Point: -34 °F

pH: 10.2 - 11

Physical State: Liquid

Specific Gravity: 1.12 - 1.14

NOTE: The freezing and boiling point values reflect a 50% solution in water at atmospheric pressure.

SECTION 10 REACTIVITY AND STABILITY

Hazardous Decomposition Products:

Thermal decomposition products are highly dependent on combustion conditions. A complex mixture of airborne solids, liquids and gases will evolve when this material undergoes pyrolysis or combustion. Acids, Aldehydes, Carbon Monoxide, Carbon Dioxide, Ketones and other unidentified organic compounds may be formed upon combustion.

SECTION 11 TOXICOLOGICAL INFORMATION

Acute Toxicity

Dermal LD50 > 2 g/kg(Rabbit) OSHA: Non-Toxic Based on components(s)

Carcinogenicity Classification

Coolant/Antifreeze

NTP: No IARC: Not Reviewed ACGIH: No OSHA: No

Cardiovascular System

Ingestion of large doses can cause metabolic acidosis that results in cardiopulmonary effects.

Developmental Toxicity

Welsch F, et al. (1988) Sprague Dawley (CD) rats were administered ethylene glycol (EG) by gavage on gestational days (gd) 6 through 20 at doses of 0, 250, 1250 or 2250 mg/kg/day (i. e., 0, 4, 20 or 36 mmol/kg/day respectively); the offspring (F1 generation) were fostered to untreated

mothers on post-natal day (pnd) 1. Maternal toxicity was seen at 1250 mg/kg/day (kidney effects) and 2250 mg/kg/day (kidney effects, decreased weight gain, decreased kidney and uterine weight). Reproductive effects were seen at 1250 and 2250 mg/kg/day (longer gestational period). Developmental toxicity was seen at 2250 mg/kg only, (increased skeletal malformations, reduced fetal body weight and viability). Hydrocephalus was observed in a non-dose related manner, and its significance is unclear. The NOAEL for both maternal toxicity and developmental/reproductive toxicity was 1250 mg/kg/day.

Kidney

Ingestion of ethylene glycol can cause bladder stones and kidney damage which can be fatal.

Liver

Prolonged and repeated ingestion of ethylene glycol has produced liver damage in rats.

Lungs

Ingestion of large doses can cause metabolic acidosis that results in cardiopulmonary effects.

Whole Animal

Orally, humans are more sensitive to ethylene glycol than rodents. The reported lethal dose range for an adult human is 1 -2 ml/kg, or 1/4 to 1/2 cup.

SECTION 12 ECOLOGICAL INFORMATION

Environmental Impact Summary:

There is no ecological data available for this product.

Environmental Fate:

The toxicity of this material to aquatic organisms has not been fully evaluated. This material must not be discharged or allowed to come into contact with sewage and drainage systems and any surface water body.

SECTION 13 DISPOSAL CONSIDERATIONS

RCRA Information:

Under RCRA, it is the responsibility of the user of the material to determine, at the time of the disposal, whether the material meets RCRA criteria for hazardous waste. This is because material uses, transformations, mixtures, processes, etc. may affect the classification. Refer to the latest EPA, state and local regulations regarding proper disposal. Follow all applicable laws and regulations. Used antifreeze recycling is recommended. Do not drain on the ground or into storm drainage systems. Do not dispose in sanitary sewer systems except where permitted by law.

SECTION 14 TRANSPORT INFORMATION

US Department of Transportation Classification

This material is not regulated under 49 CFR if in a container of 119 gallon capacity or less. If shipped in a container of over 119 gallon capacity then the DOT information must be accompanied with RQ notation, or, an otherwise 'Not Regulated' product will be classified as Environmentally Hazardous (solid/liquid) N.O.S., Class 9, Packing group III unless the product qualifies for the petroleum exemption (49 CFR 171.8).

Hazardous Substance/Material RQ: Ethylene glycol / 5252.2498 lbs

International Air Transport Association

Hazard Class/Division: 9 (Miscellaneous)

Identification Number: UN3082

Packing Group: III

Effective January 1, 2005

Proper Shipping Name: Environmentally Hazardous Substances, Liquid, N.O.S.
Technical Name(s): Ethylene Glycol

International Maritime Organization Classification

Hazard Class/Division: 9 (Miscellaneous)
Identification Number: UN3082
Packing Group: III
Proper Shipping Name: Environmentally Hazardous Substances, Liquid, N.O.S.
Technical Name(s): Ethylene Glycol

SECTION 15 REGULATORY INFORMATION

FEDERAL REGULATORY STATUS

OSHA Classification:

Product is hazardous according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Comprehensive Environmental Release, Compensation & Liability Act (CERCLA):
Ethylene Glycol RQ 5000 lbs Reportable Spill => 5252 lbs or 630 gal

Ozone Depleting Substances (40 CFR 82 Clean Air Act):

This material does not contain nor was it directly manufactured with any Class I or Class II ozone depleting substances.

Superfund Amendment & Reauthorization Act (SARA) Title III:

There are no components in this product on the SARA 302 list.

SARA Hazard Categories (311/312):

Immediate Health:YES Delayed Health:YES Fire:NO Pressure:NO Reactivity:NO

SARA Toxic Release Inventory (TRI) (313):

Ethylene Glycol

Toxic Substances Control Act (TSCA) Status:

All component(s) of this material is(are) listed on the EPA/TSCA Inventory of Chemical Substances.

This product may be subject to export notification under TSCA Section 12(b); Contains: Nitrous acid, sodium salt

Other Chemical Inventories:

Component(s) of this material is (are) listed on the Australian AICS, Canadian DSL, European EINECS, Korean Inventory, Philippines PICCS,

SECTION 16 OTHER INFORMATION

Revision#: 0

Revision Date: 03/26/2002

Revisions since last change (discussion): This Material Safety Data Sheet (MSDS) has been reviewed to fully comply with the guidance contained in the ANSI MSDS standard (ANSI Z400.1-1998). We encourage you to take the opportunity to read the MSDS and review the information contained therein.

SECTION 17 LABEL INFORMATION

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR

DISPOSING OF PRODUCT. THIS LABEL COMPLIES WITH THE REQUIREMENTS OF THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) FOR USE IN THE WORKPLACE. THIS LABEL IS NOT INTENDED TO BE USED WITH PACKAGING INTENDED FOR SALE TO CONSUMERS AND MAY NOT CONFORM WITH THE REQUIREMENTS OF THE CONSUMER PRODUCT SAFETY ACT OR OTHER RELATED REGULATORY REQUIREMENTS.

PRODUCT CODE(S): 94083, 9408300001, 9408300055, 9408310011

SHELL™ Fully Formulated Phosphate Free Coolant/AF

WARNING!

MAYBE HARMFUL OR FATAL IF SWALLOWED. MAY CAUSE ACIDOSIS, CARDIOPULMONARY AND KIDNEY EFFECTS. MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION. The following organs and/or organ systems may be damaged by overexposure to this material and/or its components.

MAY CAUSE DAMAGE TO: Cardiovascular System, Kidney, Liver, Lungs

Refer to Section 11, Toxicological Information, for specific information on the following effects:
Developmental Toxicity

Precautionary Measures:

Avoid prolonged or repeated contact with eyes, skin and clothing. Avoid breathing of vapors, fumes, or mist. Use only with adequate ventilation. Keep container closed when not in use. Wash thoroughly after handling.

FIRST AID

Inhalation: Move victim to fresh air and provide oxygen if breathing is difficult. Get medical attention.

Skin Contact: Flush exposed area with water and follow by washing with soap if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment. If skin irritation persists after washing, get medical advice.

Eye Contact: Flush eyes with plenty of water while holding eyelids open. Rest eyes for 30 minutes. If redness, burning, blurred vision or swelling occur, transport to nearest medical facility for additional treatment. If eye irritation persists, seek medical advice.

Ingestion: DO NOT take internally. If swallowed, IMMEDIATELY contact a poison control center, emergency treatment center, or physician. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs.

FIRE

SPILL OR LEAK

Dike and contain spill.

FOR LARGE SPILLS: Remove with vacuum truck or pump to storage/salvage vessels.

FOR SMALL SPILLS: Soak up residue with an absorbent such as clay, sand or other suitable material. Place in non-leaking container and seal tightly for proper disposal.

CONTAINS: Ethylene Glycol, 107-21-1; Deionized water, 7732-18-5; Sodium Nitrite, 7632-00-0; Sodium Hydroxide, 1310-73-2

NFPA Rating (Health, Fire, Reactivity): 2, 1, 0

TRANSPORTATION

US Department of Transportation Classification

Effective January 1, 2005

This material is not regulated under 49 CFR if in a container of 119 gallon capacity or less. If shipped in a container of over 119 gallon capacity then the DOT information must be accompanied with RQ notation, or, an otherwise 'Not Regulated' product will be classified as Environmentally Hazardous (solid/liquid) N.O.S., Class 9, Packing group III unless the product qualifies for the petroleum exemption (49 CFR 171.8).