
Polaris Mine Demolition and Site Reclamation

Spill Contingency Plan

May 20, 2003

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1.0 INTRODUCTION

The Polaris Mine is located on Little Cornwallis Island within the Territory of Nunavut (Figure 1, Appendix 1) and is an underground lead and zinc mine owned and operated by Cominco since 1981 (now Teck Cominco). Mining of the ore body reserve is completed and Teck Cominco now intend to proceed with implementation of decommissioning and site remediation activities to return the site, as close as possible, to natural conditions. SNC- Lavalin Engineers and Constructors Inc. (SLE&C) have been retained by Teck Cominco to undertake the Demolition and Site Reclamation Plan ("Closure Plan") for the Polaris Mine.

SLE&C have prepared a Spill Contingency Plan (SCP) in accordance with the requirements of the Tender Documents (Contract 2071-C.01, Section 3.20.1 - Waste Control and Environmental Protection). The SCP is intended to update the previous spill response plan prepared by Teck Cominco, as filed with the Northwest Territories, for the operations period of the mine. As such, the contents of the SCP also conform to the general requirements for spill response plans, as detailed in the Nunavut *Spill Contingency Planning and Reporting Regulations* (Appendix 3).

1.1 Purpose

The purpose of the Spill Contingency Plan is to provide a course of action to be implemented in the event of an incidental release of hazardous/toxic substances in order to prevent and/or minimize any possible harmful effects to the environment.

The plan describes detail actions for monitoring, prevention and containment of spills, spill response reporting to regulatory agencies, as well as provisions for clean-up and disposal of spilled hazardous materials.

The SCP is designed for SLE&C site staff, including its sub-contractors, and defines responsibilities of key personnel and procedures/protocols to be followed when responding to a spill.

The SCP for the Polaris Mine is intended to allow for the most effective deployment of resources to achieve the following primary objectives:

- immediate notification within the company to assure that an appropriate and timely response is initiated;
- ensure compliance with regulations for notification and reporting of spills to all parties involved;
- provide the earliest possible response to a spill scenario with available on-site and off-site resources;

- a response consistent with remedial action requirements, which include the need for containment, clean-up and disposal phases; and
- to assign roles and responsibilities in the event of a spill.

1.2 Description of Mine Closure Activities

The Polaris Mine closure phase began September 2002 with all decommissioning and site reclamation activities to be completed by October 2004. A site plan showing the layout of key facilities at the Polaris Mine is presented in Figure 2 (Appendix 1).

The primary work activities to be undertaken as part of the Closure Plan for Polaris Mine, as approved by the Nunavut Water Board and Federal Department of Indian Affairs and Northern Development (DIAND), include:

- contaminated soil and waste remediation;
- remediation and reclamation of Garrow Lake tailings pond;
- demolition and disposal of
 - the concentrator and barge
 - concentrate storage facility
 - cemented rock fill plant
 - accommodation complex
 - tailings thickener facility
 - fuel storage tanks, tanks farm and distribution equipment and piping
 - miscellaneous buildings and structures;
- removal and disposal of sheet pile dock structure and shoreline remediation;
- airstrip reclamation and remediation;
- demolition/salvage and disposal of electrical generation, distribution and communications equipment;
- handling and disposal of hazardous and toxic waste;
- construction of cover cap for operations landfill and Little Red Dog quarry; and general grading of mine site.

2.0 HAZARDOUS SUBSTANCES - STORAGE FACILITIES AND DISPOSAL

2.1 Chemicals

Teck Cominco collected, packaged and removed hazardous substances, including chemicals reagents used during operations, as part of its production shut down of the mine. Chemicals and reagents in bulk containers/pallets and drums that were transported off-site by Teck Cominco in August/September of 2002, prior to turnover of the site to SLE&C, included:

- Quicklime;
- MIBC (Methyl Isobutyl Carbinol);
- Percol 351 (flocculant);
- Potassium Amyl Xanthate (flotation reagent);
- Zinc Sulphate;
- Copper Sulphate;
- Sodium Sulphate; and
- Sodium Cyanide.

In spite of Teck Cominco removing the maximum amount of hazardous materials, it is inevitable that limited quantities of materials will be encountered in the course of the demolition and site reclamation works. Remnant chemicals will be collected and stored in containers designated and approved to receive these materials for transportation off-site. In addition, SLE&C will need to store, handle and use chemical materials to complete the scope of work. Hazardous chemical substances to be stored on-site for use and/or disposal include the following:

Chemical and Reagents From Mining/Milling Operations

Residue chemicals arising from the post clean-up of process equipment are anticipated. Following testing of effluent, flushed from the lines, disposal and management options of chemical residuals will be implemented in accordance with the waste management plan. Should it be required, residual chemicals considered to be hazardous will be stored and sealed in 205 L (45 gallon) drums on pallets for off-site disposal or, if suitable, for disposal at the on-site liquid waste incinerator. All hazardous waste materials will be handled, stored and transported in accordance with Federal Transportation of Dangerous Goods Act and Regulations (TDGA). This will include proper manifest documentation and use of licensed waste carriers and receivers.

Ammonium Nitrate

Ammonium Nitrate (NH_4NO_3) will be used in the preparation of explosive (ANFO) needed for the demolition and reclamation works. Ammonium nitrate is water-soluble and contact with oxidizing materials at high temperatures may cause self-ignition. Ammonium nitrate will be stored on-site in 25-kg plastic bags (46 bags per pallet) underground. All ammonium nitrate is expected to be used prior to the completion of the closure works in 2004. Any uncontaminated ammonium nitrate remaining at the end of closure works in 2004 will be buried in one of the on-site landfills as directed by Teck Cominco.

Glycol

Glycol (Antifreeze) is used throughout the mine in the heat exchange system for diesel generators and in the main heating system in the accommodation complex. As well glycol and extended life coolant will also be used for various equipment and site vehicles. Glycol will be delivered by sealift in 205-L drums and will be stored on pallets in well-marked locations on the pad below the diesel tank farm. Approximately 12 drums will be stored on-site. The remaining glycol, either brought for operations or drained from the existing facilities at the time of reclamation completion, will be disposed of in the dual stage incinerator as per the waste management plan.

Compressed Gases

The following compressed gases will be used and stored on-site during the closure phase:

- Acetylene - stored adjacent to foldaways in designated containers(cutting)
- Nitrogen - stored adjacent to the foldaways in designated containers (welding)
- Medical gases – i.e., oxygen stored in First Aid Stations both underground and above ground;
- Helium - stored inside air strip building/tower for weather balloon; and
- Freon - used in the refrigeration system for the accommodation complex and underground mine. Additional freon is stored in designated containers adjacent to the new warehouse and in a designated container on the oil pad
- Oxygen- Is generated and stored on-site in designated containers adjacent to the foldaways.
- Halon- is used for the fire suppression system for NWTEL systems room and is located on second floor "C" at the north end of the building.
- Propane-is stored on site in designated containers adjacent to the foldaways and is used in the cutting process.

All remaining compressed gases in cylinders at the project end will be removed off-site for re-use or disposal, as part of the site demobilization in 2004.

2.2 **Petroleum Products**

The following fuel storage tanks are located at the Polaris Mine site.

<u>Tanks (diesel)</u>	<u>Location</u>
Two - 5.5 million L	fuel tank farm
200,000 L	fuel tank farm
22,700 L	barge, vehicle servicing
10.6 million L	barge hull
22,700 L	barge, day tank
8,400 L	accommodation building
2,270 L	thickener generator
34,100 L	CAT generator
8,400 L	fire hall
2,270 L	foldaway building
35,000 L	concrete rock fill plant
15,000 L	underground explosive plant

Diesel will be the main fuel used during the site reclamation works. Two types of diesel will be used, P20 and P50. The P20 will be used for power generation and P50 for mobile equipment on the surface and underground. It is expected that a maximum of approximately 6.5 million L of diesel fuel will be on-site at any given time during the closure works.

Gasoline usage is expected to be minimal, and will be restricted to that used for skidoos, all-terrain vehicles (ATV's). Gasoline will be stored in 205-L gallon drums on the oil pad and will be transported by air from Resolute, as required.

Lubricating hydraulic/transmission oil, grease and engine oil for equipment and generators will be stored in 205-L drums on pallets in well a marked location beside the fuel tank farm. Approximately 156 drums (total of 31,980 L) will be delivered each construction season to supply the needed lubricating oils for equipment and vehicles.

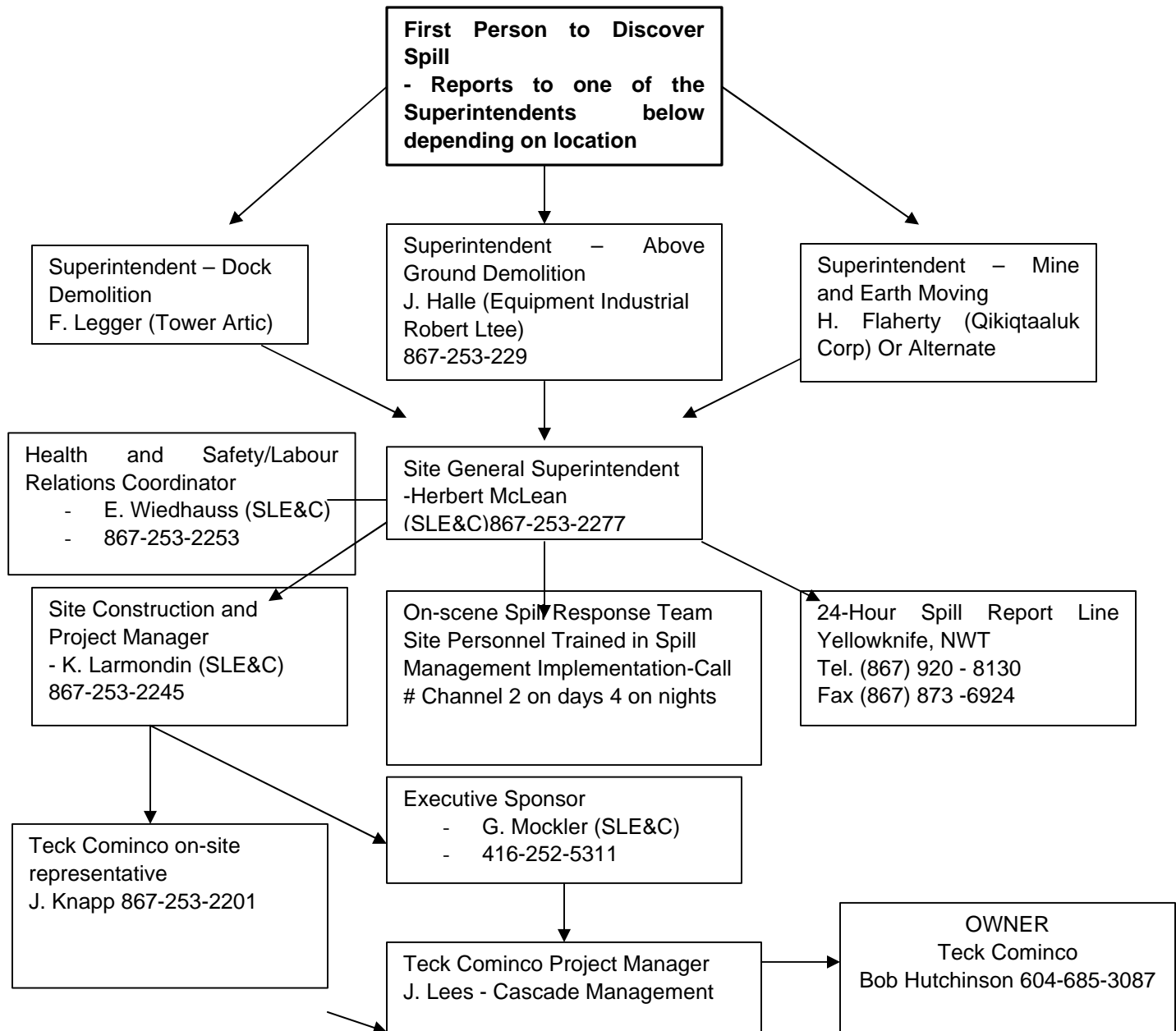
Jet B fuel will be stored in drums on pallets at the airstrip to refuel the Medivac in case of emergency. Approximately 40 drums or 8,200 L will be stored on-site.

Prior to the demolition and disposal of site storage tanks and distribution lines (during 2003 and 2004), residual fuel/sludge, and/or any un-used fuel will be pumped to a holding tank for processing and destruction at the on-site liquid waste incinerator. The liquid waste disposal system (ECO Waste Liquid Waste Oxidizer Model CA 1156PH-01) will also be used for incineration of waste oils and lubricating oils from equipment servicing. The incinerator system is a portable incinerator/evaporator unit that is capable of processing approximately 1,500 L/day (based on 10-hour day) of waste fuel and will be in compliance with prescribed Canadian air emission standards. The liquid waste incinerator will be salvaged for re-sale or re-use elsewhere and is tentatively scheduled for off-site removal at the end of the project in October 2004.

3.0 RESPONSE ORGANIZATION STRUCTURE AND REPORTING SEQUENCE

Figure 3 indicates the response organization structure and their reporting protocol for a spill situation. This organization and reporting structure also includes SLE&C speciality subcontractors, Tower Arctic Ltd., Équipements industriels Robert Itée, and Qikiqtaaluk Corporation.

Figure 3 - Response Organization Structure and Reporting Sequence



4.0 ORGANIZATION ROLES AND RESPONSIBILITIES

The major responsibilities and roles of key employees who will be participating in a spill response situation is presented in Table 1.

Table 1 – Responsibilities of Key Project Personnel for Spill Incident

Title	Responsibility
<p>SLE&C Site Construction/Project Manager - K. Larmondin Tel. 867-253-2245, 867- 253-6858(off hours) (24- hour line)</p> <p><i>Address:</i> <i>LCI Polaris Mine Site</i> <i>SNC Lavalin Engineers & Constructors Inc.</i> <i>C/O First Air- Resolute Bay NU</i> <i>Box 150 Resolute Bay</i> <i>X0A 0V0</i></p> <p><i>Corporate Address:</i> <i>SNC-Lavalin Engineers and Constructors Inc.</i> <i>2200 Lake Shore Blvd.</i> <i>West</i> <i>Toronto, Ontario</i> <i>M8V 1A4</i></p>	<ul style="list-style-type: none">• Activates the Spill Contingency Plan (SCP) based on assessment of spill.• Provide liaison and maintain effective line of communication with SLE&C Executive Sponsor and Teck Cominco Project Manager and on-site representative of spill response, containment and clean up.• Ensure that all phases SCP are appropriately implemented.• Ensure, along with the General Site Superintendent and H&S Coordinator that necessary equipment and training is in place for spill response to meet or exceed legislative requirements.• Report and provide advice/recommendations to all levels of management for the project.• Based on input from the Site General Superintendent and H&S Coordinator, provide Spill Report to SLE&C and Teck Cominco Project Manager and onsite representative and external agencies.• Provide Teck Cominco Project Manager and onsite representative with documentation, follow-up and liaison with government agencies and media.• Review all spill incidents, including any injury and/or property/environmental impact, and ensure that appropriate containment, recovery and cleanup action is initiated.

Table 1 – Responsibilities of Key Project Personnel for Spill Incident

Title	Responsibility
<p>SLE&C Site General Superintendent Herbert McLean</p>	<ul style="list-style-type: none"> • Support the efforts of the Site Construction and Project Manager. • Evaluate spill situation and assess magnitude of spill. • Provide immediate notification to Site Construction/Project Manager and provide recommendation with respect to activation of spill contingency plan. • Provide notification of spill incident to 24-hour Spill Report Line and other supportive external organizations. • Coordinate and oversee personnel and equipment resources to conduct spill containment, recovery, clean-up and disposal. • Document chronology of spill event and clean-up efforts.
<p>Teck Cominco Project Manager, J. Lees</p> <p><i>C/O - Cascade Management, 306-2047200Hanselman Court Saskatoon, Saskatchewan</i></p>	<ul style="list-style-type: none"> • Provide advice to Teck Cominco senior management team for project. • Review Spill Report and actions taken for containment, recovery and clean up and recommend changes if necessary. • Act as company spokesperson with government agencies and media.
<p>SLE&C Health and Safety Coordinator E. Wiedhauss 867-253-2253, 867-253-6600(off hours)</p>	<ul style="list-style-type: none"> • Inspects the spill area on a continuous basis to assess health and safety hazards and provide appropriate direction. • Coordinate off-site trained medical personnel and resources and secure site, if required. • Implement spill training and simulation exercise for spill response. • Support the efforts of the General Site Superintendent.

Table 1 – Responsibilities of Key Project Personnel for Spill Incident

Title	Responsibility
Subcontractors - Tower Artic - Equipment Industrial Robert Ltee - Qikiqtaaluk Corp)	<ul style="list-style-type: none">• Report spill immediately to SLE&C Site General Superintendent.• Initial response and any clean up in the absence of any SLE&C supervisory direction.• Responsible for spill response training of their own personnel.• Advise all their employees of the existence of SCP• Provide manpower and equipment on a priority basis to undertake spill containment, recovery and clean-up.

Activation of Spill Contingency Plan

As specified in the above table, the SLE&C Site Construction/Project Manager is responsible for activation of the Spill Contingency Plan and will be in charge of its overall management and implementation. Spills will be reported in accordance with the amounts set out in Schedule B (i.e., 100 L for diesel) of the Nunavut *Spill Contingency Planning and Reporting Regulations* (Appendix 3) following an assessment of the type and amount of material spilled. All spills will be immediately contained, where safe to do so, and appropriate remedial actions initiated for recovery, clean up and disposal.

4.1 Spill Reporting

During mine closure construction activities, all persons working either below or aboveground will be in a position to detect spills. Notification of any spill will be made immediately to the appropriate Superintendent. The SLE&C General Site Superintendent will notify the Site Construction/Project Manager. Actions to contain and clean up a spill will be initiated immediately.

4.1.1 External

Spills of petroleum products or other hazardous substances will be reported to the Nunavut/Northwest Territories 24 hour Spill Report Line, in accordance the regulations. Upon notification of a spill, the Teck Cominco Project Manager will act as the owner/company spokesperson and under their discretion will report the spill to other regulatory agencies, such as the DIAND and Federal Department of Fisheries and Oceans. All spills must be reported to the regulatory agencies within 24 hours of their occurrence. Telephone number is 867-920-8130. A written report is also required and is to be faxed to 867-873-6924.

The SLE&C Construction/Project Manager will be the primary site contact person between the regulatory agencies and the Polaris Mine in the event of a spill.

In accordance with the regulations, a Spill Report will be prepared and transmitted to the Nunavut/N.W.T. spill centre by the Construction/Project Manager. If the Superintendent is not available, the SLE&C Construction/Project Manager will assign the task of reporting the spill as the situation dictates.

Reporting Instructions:

1. Fill out ***"Spill Report"*** form as completely as possible. This report must be filled out and submitted within 24 hours of the occurrence.
2. Report to the 24-hour Spill Report Line. All spills will be reported by telephone. The Fax number is only to be used to transmit more detailed information and the written Spill Report.

24 Hour Spill Report Line

Telephone Number: (867) 920-8130

Fax Number: (867) 873-6924

Other contacts in Nunavut and N.W.T. are:

Environmental Protection Service	Phone: (867) 975-5900
Dept. of Sustainable Development	Fax: (867) 975- 5981
Government of Nunavut	

Government of the N.W.T.	Phone: (867) 873-7654
Pollution Control Division	Fax : (867) 873-0221
Yellowknife, N.W.T	

Indian and Northern Affairs Canada	Phone: (867) 975-4549
Environment and Contaminants	

Environment Canada	Phone (867) 920-8130
Environmental Protection	
(MMER)	

5.0 SPILL RESPONSE AND ACTION PLANS

Potential Spills

During the decommissioning and site reclamation works a spill of petroleum products, chemicals or demolished waste material could occur on land, into a water body and/or on ice/snow. Many variables, such as weather and staff preparedness, play an important role in a spill response operation. A spill from an overflowing fuel tank or breaking of a hydraulic hose is likely the most common spill to potentially occur on-site. The worst case spill scenario would involve a rupture of a fuel storage tank or spill during bulk unloading of fuel from the shoreline to the dock area. Spills could be caused by a check valve set in the wrong position, fuel sent to the wrong destination or someone forgetting to shut a valve off after a fuel transfer and overfilling of receiving vessels. However, such situations are expected to be successfully avoided by prevention and mitigated by use of Spill Action Plans (SAP) presented in the following sections.

5.1 Prevention

Prevention is the critical element to avoid a release of hazardous substances. Effective on-site prevention measures can ensure protection of the environment, prevention of injury to personnel and ultimately avoid expensive clean-up costs. Good house keeping measures will entail regular maintenance and routine inspection/monitoring of equipment, storage facilities/tanks and liquid waste incinerator system, as well as record keeping.

Key spill prevention practices will include the following:

- On-site storage facilities for hazardous materials will use existing Teck Cominco secondary containment measures (i.e. berms, liners)
- All storage areas will be provided with well maintained equipment and containers to be handled only by personnel familiar with proper handling;
- Where practical, site transfer and transportation will be performed using secondary containment systems;
- Good house keeping practices in areas like the shoreline during bulk fuel unloading and storage tanks facilities; and
- Accessories such as transfer hoses with camlock mechanisms, drip pans and pumps will be inspected and monitored on a regular basis to ensure they are good working order.
- Supervision and auditing of material transfers.

The SLE&C Health and Safety Coordinator will audit and document the existing

condition of equipment and storage facilities and will make recommendation for repairs should problems be encountered. Designated personnel will inspect storage vessels and transfer piping on a regular basis and record in a log listing items inspected. This task will include recording the amount and compatibility of materials stored, levels of fluids and inventory of personnel protective equipment.

Other preventative measures will include spill response and awareness training for personnel to identify sensitive areas/features, potential spill locations, location of site clean-up kits and proper initial response action. Training of personnel, as well as simulating practice drill exercises, will help ensure a spill response is effective and efficient to minimize potential impacts. Further details on spills training and exercises are contained in Section 6.0.

5.1.1 Petroleum Storage Tanks

In the case of a fuel storage tank rupture the impact would be high. Although fuel tanks will be progressively decommissioned through the closure period, the probability of rupture of active tanks will be reduced by comprehensive training of personnel, regular maintenance, frequent inspections and use of existing impervious geomembrane liners and berming.

Dykes with an impermeable lining are located around the 5.5 million-L storage tank to contain any spill. Dykes have sufficient impoundment volume to retain 110% of the tank volume or 6,300,000 litres. The area within the dyke slopes toward the drainage area to facilitate spill collection.

The vehicle fuel tank, day tank and CAT tank are equipped with an existing protective post barrier to prevent vehicles from hitting the tanks.

The barge hull fuel tank will be used during the 2002/2003 season and then decommissioned in 2004. The barge tank has an existing heavy steel plate completely around the hull to prevent any damage from mobile equipment.

5.1.2 Open Valves or Pipe Failures

Although tanks and distribution pipelines will be progressively decommissioned, spills will be prevented by:

- Locking all valves that are not in use;
- Providing double locking fuel transfer hoses, mark and tag valves or use a lock out system;
- Installing markers to delineate all active distribution lines;

- Training of personnel in regards to requirements of the TDGA; and
- Providing spill kits in vehicles where practical.

5.1.3 Hydraulic Hose Examinations

Preventative measures to be undertaken to avoid an equipment hydraulic hose leak

- Check/Inspect for wear and leaks;
- Rigorous maintenance schedule;
- Training of personnel; and
- Providing spill kits in vehicles where practical.

5.1.4 Fuelling Equipment

Preventative measures to be undertaken to avoid overfilling of equipment tanks and overflows:

- Record all fuel transfers and log.
- Do not leave filling device unattended.
- Measure the content of fuel in tanks to estimate the amount of fuel required to fill.
- Visually check vessel fluid levels while filling.

5.1.4 Spills from Vehicle/Equipment Accidents

The following preventative measure will be exercised to avoid spills from vehicle/equipment accidents:

- Strict enforcement of speed limit;
- Site signage and warning devices for moving equipment;
- Training of personnel (TDGA); and
- Providing spill kits in vehicles where practical.

5.1.5 Chemicals

The probability of a chemical spill is low as the majority of mine chemicals and process reagents were removed prior to the initiation of the decommissioning and reclamation works. The preventative measures to reduce the risk of a chemical spill include:

- Chemicals will be stored in appropriate containers and properly labelled;
- Oxygen, acetylene, propane and nitrogen will be stored in sea containers;
- Storage facilities will be weather and fire protected; and
- Training, inspection and inventory control.
- Empty drums sent to the dump should have hazardous material labels removed.

5.1.6 **Fires**

Diesel and other hydrocarbon are combustible and therefore no smoking or ignition sources will be allowed within 20 m of fuel storage areas. Signs if not already present will be installed. Ammonium nitrate (solid) can ignite and will be kept away from oxidizers. Compressed gases (oxygen, acetylene) can ignite with explosive power and the cylinders will be stored to minimize such an occurrence in accordance with safe storage regulations.

5.1.7 **Material Safety Data Sheets (MSDS)**

To provide information with respect to potential contact with hazardous and flammable substances and information on their safe handling, SLE&C will provide MSDS for all materials to be transported, stored and used on site. The MSDS will be made available at the Mine site office and at strategic location on-site and near hazardous substances storage areas. MSDS (Appendix 2) will be in accordance with WHMIS standards.

5.2 **Initial Action**

This section outlines the initial actions to be taken by the first person(s) discovering a hazardous materials spill. Following the initial action, the appropriate Spill Action Plan will be immediately implemented. Initial actions to be taken by the first person arriving/witnessing a spill include:

- ⇒ Ensure ones personal safety and anyone else in the area. If possible, identify the product spilled;
- ⇒ Immediately contact SLE&C Superintendent and report the spill;
- ⇒ Assess whether the spill can be readily stopped or brought under control. If you are **sure** it is safe to do so, try to stop the flow of material;
- ⇒ If the spill of material cannot be stopped safely, attempt to contain the spill material. The prime objective is to minimize risk to personnel and to prevent any spills from reaching the ocean;
- ⇒ If unsure whether it is safe to approach the spill, **remain clear of area**. Report the spill to the SLE&C Site General Superintendent and then ensure that no one else accidentally approaches the spill; and
- ⇒ Record all relevant information for reporting purposes. i.e. who, what, when, volume weather, where.

5.3 Spill Action Plans

The following sections describe the procedures/protocols for containment, clean-up and disposal to be implemented in the event of a spill.

5.3.1 Spill Off-Shore - Unloading of Bulk Fuel Delivery

Unloading Operations:

Surveillance

- Determine spill limits by visual observations from tanker or boat. Identify containment and limit the drainage.

Range of Spill

- Immediate detection and normal cessation of pumping should limit a spill to no more than 15,000 litres.

Deployment of Equipment

- Set out booms. Located in containers adjacent to the dock. Boat for deployment is also located in container. These containers have signs on them to indicate that they contain spill kits.
- Set skimmer at apex of V formed by the booms. The skimmer is located in heated storage at the warehouse. Teck Cominco's skimmer will also be located here.

Recovery

- Pump recovered oil/water mixture into an empty hold of the tanker.
- If spill exceeds available storage capacity, then line low areas with impermeable plastic sheeting for temporary storage.

Disposal

- Transfer recovered oil that is not contaminated with significant quantities of water and debris to oil storage tanks for future use.

- Pump recovered oil that is contaminated to incinerator system holding tank for controlled burning.

Diesel Line Breakage:

Frequency of Diesel Line Use

- Tank filling will be done once per year.
- Diesel is transferred on a daily basis from the storage tank (fuel tank farm) to the accommodation complex.

Preventive Measures

- Visual inspections of lines will be carried out prior to each transfer. Any line damage will be repaired prior to use of the line. Inspection will note the valve positioning.

Detection

- Pressure can be used to detect major line breakage. This can be accomplished by having gauges on the discharge of fuel transfer pumps. Upon sensing a drop in line pressure, transfer of fuel will be stopped manually by fuel transfer personnel.
- Limits of spill will be visible.

Immediate Action

- Cease pumping immediately.
- Inspection of the broken line will be done immediately to determine the cause and location of breakage, in order to decide upon remedial measures.

Recovery

- Remove pooled fuel with SPATE pumps or manual double-diaphragm pump.
- Complete cleanup by use of absorbent pads. From spill kit containers.

5.3.2 Diesel, Hydraulic/Transmission Fluids and Waste Oil

Spill On Land

- Secure area and restrict access to unnecessary personnel.
- Provide containment by digging cut off trenches and berming.
- Stop or cover entrance of spilled material into watercourse or ditches/drains.
- Stop a tank leak/overflow by the following actions;
 - Cease filling operations
 - Turn off valve(s)
 - Utilize patch kit to seal leak(s) These are located with the H.E Shop for fuel tank repairs.
 - Contain spill
 - Close drains
- Build dikes or berms with earth, sand or other blocking media to contain spill.
- Remove/clean-up small spill by applying absorbents and place contaminated material in marked containers/drums.
- Recover large quantity spill with pump and transfer to drum(s) or storage tank for re-use or disposal at on-site liquid waste incinerator.
- Remove soil material affected by spill using shovels, backhoe or other mechanical method, when safe to do so.
- Contaminated soil material is to be temporarily stockpiled with protective plastic liner placed under and over stockpile.
- Segregate and dispose of contaminated soil material and absorbents to off-site licensed disposal facility or, if approved, to on-site location (underground Mine).

Spill On Snow and Ice

- Stop or cover entry of spill material into watercourse, ocean or ditches/drains.
- Build dykes with snow and water to make impermeable barrier for containment.
- Cut or excavate slots or trenches in ice/permafrost as a secondary containment measure for spill.
- Remove small spills by applying absorbent or snow.
- Remove large spills with pump and transfer to drums or storage tank.
- Burn (in-situ) spill material collected in trench, if safe to do.
- If spill is under ice, drill through ice and pump out spill to storage tank or drums for reuse or disposal at on-site liquid waste incinerator.
- Dispose of contaminated absorbents to off-site licensed disposal facility or, if approved, to on-site location (underground mine).

Spill On Water

In addition to the specific procedures detailed in Section 5.3.1 for an off-shore spill, the following general procedures will be followed for spills on water.

- Deploy boom to contain the floating product.
- Use skimmer to collect contained product.
- Use absorbent pads to recover small spills on water. For large spill seek assistance from external environmental unit.
- Pump recovered material to tank for storage and disposal.
- Recovered product is to be recycled for use or transferred to liquid waste incinerator for disposal.

5.3.3 Chemicals

Chemicals remaining on site after Teck Cominco demobilizes will be handled in accordance with WHMIS standards. Some of these chemicals are identified in section 2.1 of this document. These will be stored and handled as per the waste management plan.

5.3.3.1 Ammonium Nitrate/Fuel Mixture (ANFO)

Spill on Land

- Fuel may be released from pellets.
- Cover drains and stop spill material from entering ditches or drains.
- Build dykes or berms with earth or sand to contain spill.
- If ammonium nitrate contacts water, try to confine and isolate.
- On dry surface remove with shovel and place in labelled secured plastic 205 L drum(s) for disposal.

Spill On Snow and Ice

- Prevent entry of spill material into water body.
- Cover or cap drains and prevent entry of material to ditch or drain system.
- Remove contaminated snow with plastic shovel and place in plastic secured container for disposal.

Spill On Water

Ammonium nitrate mixes with water (soluble) and is difficult to recover. In water,

the fuel mixture component of ANFO will be released and float to surface. To remove and recover the fuel, use an absorbent pad or skimmer. Spent absorbent pads are to be placed into containers for disposal.

5.3.3.2 Compressed Gases (Oxygen, Nitrogen, Acetylene, Propane)

Actions to be taken in the event of a compressed gas spill include:

- Refer to product properties MSDS, First Aid;
- Eliminate Ignition sources; ie. electrical power, lights, smoking, running vehicles
- Do not try to contain vapours when released;
- Personnel should withdraw immediately from area unless the leak is contained;
- Keep away from ends of tank/cylinder ends;
- If cylinders are damaged, gas should be dispersed and contained; and
- Shut off leak source;
- If small fire, extinguish with dry chemicals or CO₂; and

USE WATER TO COOL CONTAINERS EXPOSED TO FIRE

6.0 TRAINING

All key SLE&C personnel and its speciality subcontractors, who will be handling, transferring and disposing of hazardous materials, or supervising personnel, will be formally trained. Training will be comprised of all pertinent spill emergency response issues and will include, but not limited to:

- Internal/external communication networks and required spill reporting and notification procedures;
- Response procedures including initial action, clean up procedures and disposal.
- Response organization;
- Individual Spill Action Plans;
- Available internal/external resources (spill clean-up equipment);
- Accessing and deployment of equipment;
- Dealing with seasonal diversities and adverse weather conditions in the context of spill response;
- Personnel protective equipment;
- Properties of hazardous materials handled, stored and used on-site;
- On/off site transportation of dangerous good;
- Environmental legislation; and
- Company Policy.

Training records will be maintained at the Polaris Mine site office by the SLE&C Health and Safety Coordinator.

Exercises

A SIMULATION PROGRAM WILL BE UNDERTAKEN QUARTERLY TO MEASURE THE EFFECTIVENESS OF THE SPILL CONTINGENCY PLAN. THE EXERCISE PROGRAM WILL INCLUDE CLASSROOM AND FIELD SIMULATIONS AND WILL DESCRIBE A RANGE OF SPILL SCENARIOS FROM MINOR EASY SPILL SITUATIONS TO LARGER COMPLEX SPILL RESPONSE AND MANAGEM

7.0 RESOURCE INVENTORY AND LOGISTICS

This section details the resources such as equipment, machinery and tools that will be available to respond to a spill and clean-up situation, as well as general site logistics.

Land

Equipment available for a land spill may include the following this can be supplemented with contractor's equipment. As equipment no longer is functional it will be retired. This is a generalized list of the existing equipment on site

8	-	4x4 Pick-Up Trucks
1	-	Case 1150 Dozer
1	-	Case 350 Dozer
1	-	Case W20 Front-End Loader
2	-	Cat 950 Front-End Loaders
2	-	Cat 980C Front-End Loaders
1	-	Cat 988B Front-End Loader
1	-	Cat 245 Backhoe Excavator
1	-	Cat 140 Grader
1	-	John Deere Grader
2	-	Cat D35C Articulated Dump Trucks
1	-	Cat D8 Dozer c/w Ripper
1	-	Cat D9 Dozer c/w Ripper
1	-	Cat V200 Forklift
1	-	Ford 8000 Dump Truck
1	-	Ford 3 Ton Service Truck
1	-	50 Ton Crane
2	-	20 Ton Cranes
1	-	Chieftain All Terrain/Snow Vehicle
2	-	Skidozer All Terrain/Snow Vehicles

2	-	Ford 9000 - 5th Wheel Diesel Tractors
6	-	Wagner 8-Yard Articulated Scooptrams
4	-	JDT 26 Ton Articulated Dump Trucks
2	-	JDT 13 Ton Articulated Dump Trucks
2	-	Wagner 2-Yard Articulated Scooptrams

Spill Response Kits

During the decommissioning works, spill Response Kits will be strategically located on-site where required. SLE&C will be responsible for providing sufficient spill response kits and speciality spill items in their work areas. These kits will be in marked packages at visible and accessible locations. Kits will be located at fuel storage and transfer areas, the mine portal area, liquid incinerator system, and chemical storage areas. As a minimum requirement, each spill kit will include the following items:

- 1 - 45 gallon (205 L) gauge open top drum with cover, bolt ring and gasket
- 1 - 48" x48" x1/16' neoprene pad (drain stop/plug)
- 2 - Splash protective goggles
- 2 - PVC oil resistant gloves
- 1 - Package polyethylene disposable bags (5 mm) 10 per pack
- 1 - Shovel (spark proof)
- 1 - Case (T-12) 3" x 12' mini booms/case
- 1 - bag (HP – 256) 17" x19"x1/2" pads, 100 pads/bail
- 1 - bag of Sphag Sorp TM

Ocean

Equipment available for an ocean spill will include the following:

Boats

- 1 - 16 ft. Work Boat with Outboard Motor
- 1 - 12 ft. Work Boat with Outboard Motor

Oil Boom/Skimmer

- Oil Boom/Oil Skimmer up to a maximum of 1000 feet

This skimmer is only intended for initial and supplementary recovery of spilled oil. The fuel ships carry spill equipment which would be used as the primary recovery unit should a spill occur.

Safety Equipment/Special Clothing

- 10 - Oil Proof Clothing (Tyvek Suits)
- 2 - D.O.T. Approved Flotation Suits
- 10 - Splash Protective Goggles
- 10 – PVC Oil Resistant Gloves
- These items will be located in the SLEC safety office.

Generators/Lights

- Spot Lights
- Portable Generators of various capacities.
- Diesel Powered Portable Lighting Plant

Other Oil Spill Control Equipment/Materials

- Anchors, Ropes, Absorbents, Miscellaneous Small Items

7.1 Resource Inventory of Fuel Supplier

Oil Tanker

Petrocanada is the prime Teck Cominco supplier of diesel oil to the Polaris Mine closure activities.

FedNav ships are equipped with a “PAGE” (Petroleum Association for the Control of the Environment) package.

Such a package contains:

Boom: Length 750 ft.
Oil Skimmer
Pumps with Floating Suction

7.2 Logistics

Sea Transportation

Shipping Season

- The normal shipping season is between mid-July and mid-October. Exact dates vary due to sea-ice conditions.
- No situation is likely in which ship movements will have to be made at other times of the year. As such, vessels of full ice breaking capacity are not required.

Shipping Route

- Access to the mine-site from the Atlantic Ocean is via Davis Strait, Lancaster Sound, Barrow Strait, south of Resolute and north through Crozier Strait.
- In years when unfavourable ice conditions exist west of Cornwallis Island, an alternate course is available north through Wellington Channel, around Cornwallis Island and south into Crozier Strait.

Vessel Movements

- There will be one supply vessel per year to provide diesel fuel (Teck Cominco to supply using existing subcontractor) and one vessel (SLE&C, Sealift) to provide oil, hydraulic/transmission fluids and other supplies.
- All ships are at least of a Type B Class, that is, having ice strengthened hulls.

Air Transportation

Seasonal Factors

- There is no major deterrent to year-round air access to the mine-site from Resolute or major centres in the south.
- Fog and blowing snow restrict flights on occasion.

Site Facilities

- The landing strip at Polaris is 1,225 metres long as listed with Navigation

Canada. It is capable of handling DC-3, Twin Otter, Dash-7 type aircraft and Hercules aircraft.

- The strip is lighted and equipped with instrument guidance beacon facilities.
- Routine air flights to and from the Polaris Mine site supply fresh food and allow for staff turnaround.

Scheduled Air Access

- Regular air service from Ottawa and Edmonton to Resolute is provided by First Air, Canadian North and Borek Air.

Local Air Service

- Ken Borek Air operates Twin Otter aircraft out of Resolute year-round.

Heavy Cargo Service

- The 737 aircraft operated by First Air are normally configured in a split cargo/passenger configuration.
- The cargo is normally transhipped from Resolute in smaller aircraft, but ice strip landings at the site are possible in the winter months, or the normal airstrip can be used by Hercules aircraft under restricted load conditions.
- The Canadian Armed Services have Hercules aircraft based in Edmonton that can provide emergency service in emergency situations.

Ground Transportation

Seasonal

- Surface transportation between Resolute and the mine-site is possible over the sea ice during the winter. Major shipments of cargo by Cat train and personnel transportation by snowmobile and Bombardier are possible, if required.

Mine-Site

- Roadways have been constructed to all surface facilities and parallel the water and tailings pipeline routes.

Communications

External

- The main communications system to the south is provided by NorthwesTel. A satellite telephone has been purchased and is located in the firehall and is tested bi-weekly.

Local

- A complete small airport air traffic control station is available. This includes a multi-channel VHF transceiver for local communications with aircraft.

Marine

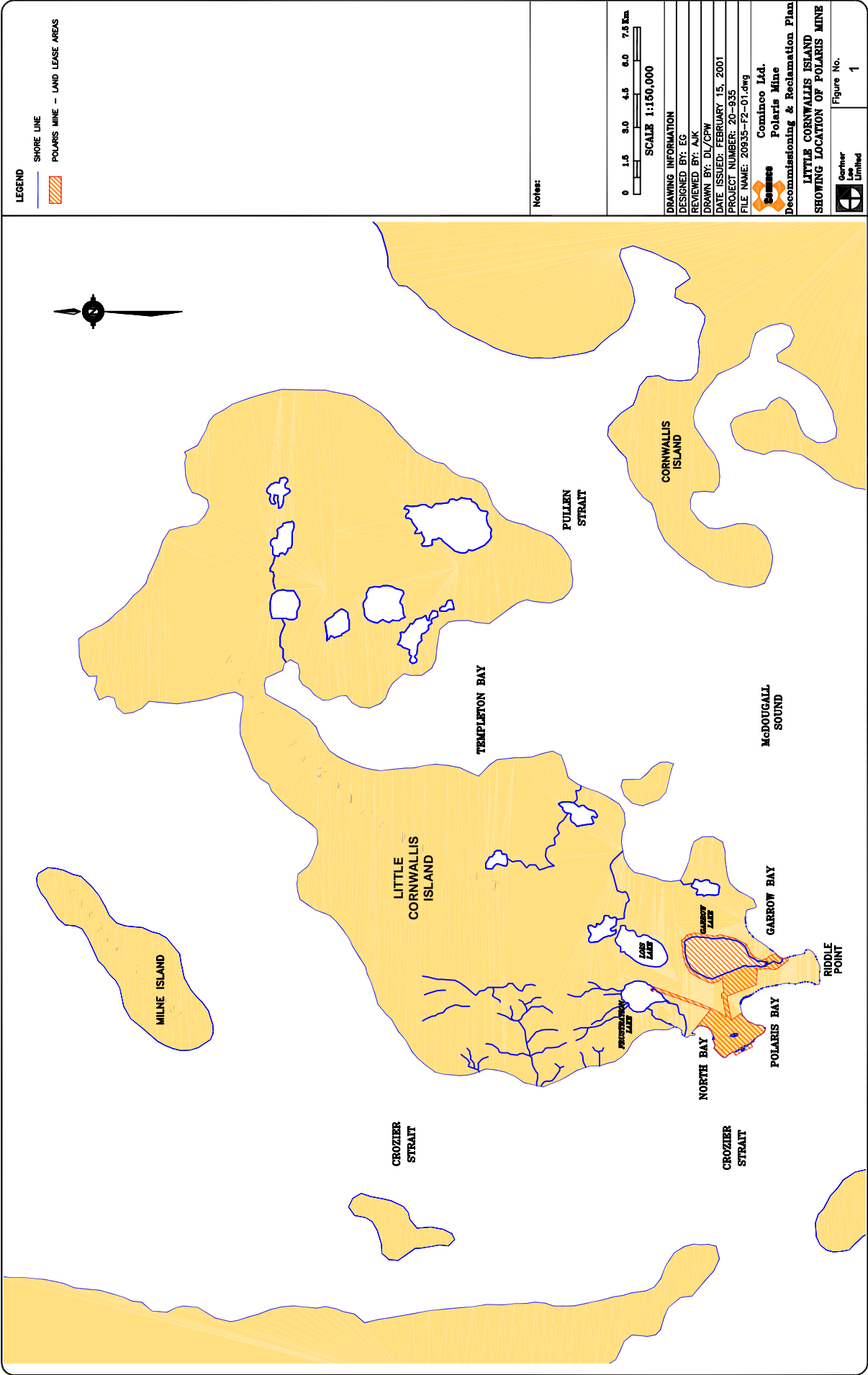
- SSB is available for long range communications over 100 km.
- VHF is used for shorter ranges and emergency communications with Resolute Bay in the event of problems with the NorthwesTel system.

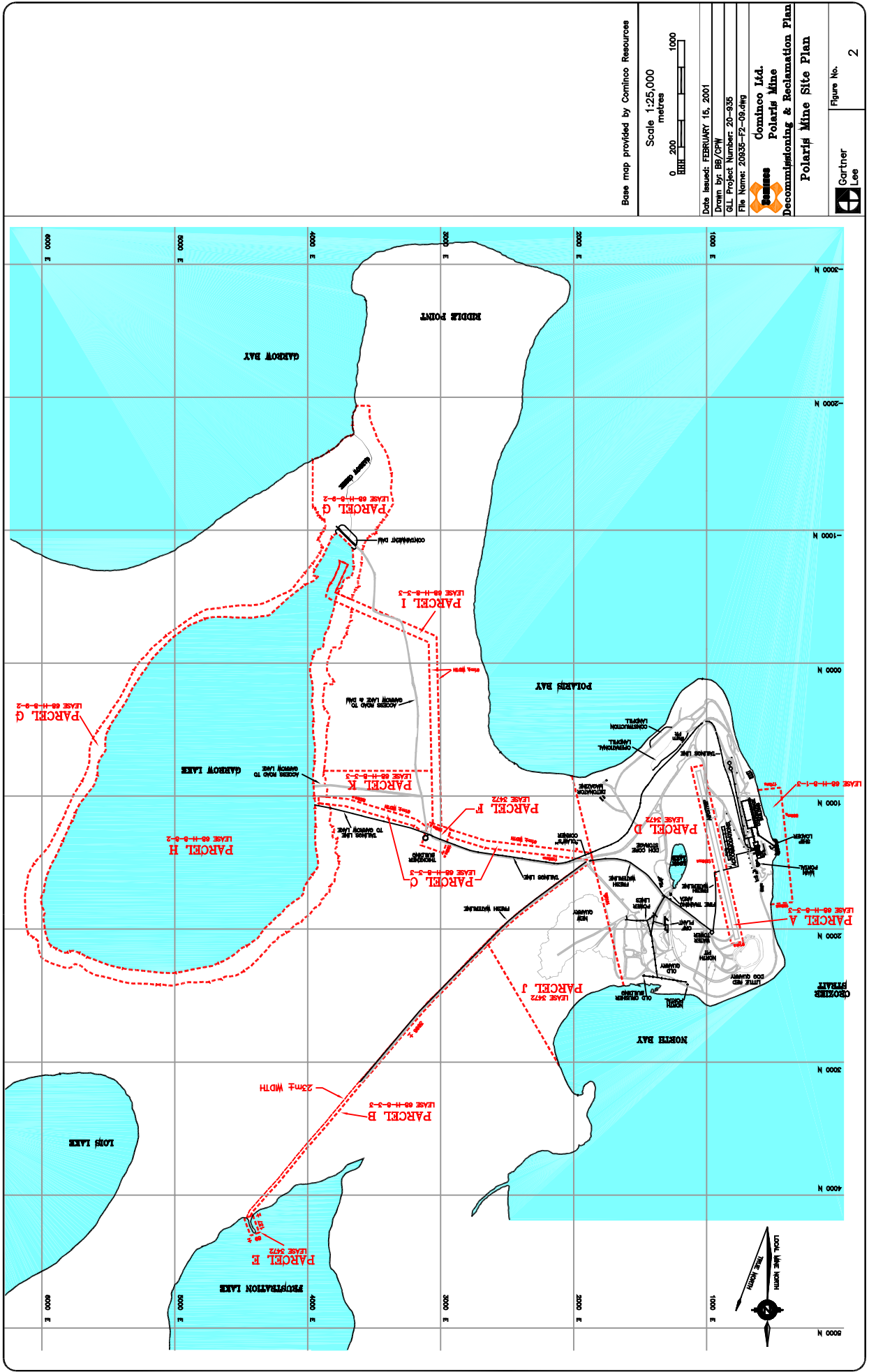
Mobile

- Mobile radios are used for all communications around the site.

Appendix 1

LOCATION & SITE MAPS





Appendix 2

MSDS Sheets

TABLE OF CONTENTS

- Acetone
- Acetylene
- Alkyd Flat Paint
- Ammonium Nitrate
- Automatic Transmission Fluid
- Copper Sulphate
- Diesel - Arctic
- Ethylene Glycol
- Freon 502
- Freon
- Gasoline - Generic
- Grease
- Halon
- Helium
- Hydraulic Oil
- Jet B Fuel
- Latex Paints
- Lead Acid Batteries
- Lead Concentrate
- Lubricating Oil
- MIBC (Methyl Isobutyl Carbinol)
- Motor Oil
- Nitrogen
- Oxygen
- PAX
- Percol 763
- Polyacrylamide
- Polyethylene Glycol
- Propane
- Quicklime
- Sodium Cyanide
- Sodium Sulphate
- Varsol
- Windshield Washer Fluid
- Xanthate – Potassium Amyl
- Zinc Concentrate
- Zinc Sulphate

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ACETONE

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 1047579

PRODUCT NAME(S) : Acetone (CCS-972)

Acetone

2-Propanone, dimethyl ketone; DMK

PRODUCT IDENTIFICATION : CAS number: 67-64-1

#C-972

DATE OF MSDS : 1995-09-01

*** MANUFACTURER INFORMATION ***

MANUFACTURER : CELANESE CANADA INC

ADDRESS : Post Office Box 99, Station Main

Edmonton Alberta

Canada T5J 2H7

Telephone: 403-471-0425

Fax: 403-471-0398

EMERGENCY TELEPHONE NO. : 403-477-8339 (In Canada)

800-424-9300 (In USA, CHEMTREC)

MESSAGE FROM CELANESE CANADA, INC: The supplier makes no warranty of any kind, express or implied, concerning the use of this product either singly or in combination with other substances. Effects can be aggravated by other materials. This product may aggravate or add to the effects of other materials. This product may be released from gas, liquid or solid materials made directly or indirectly from it. User assumes all risks incident to its use. User must communicate to its employees and customers, including consumers of its products, all warnings that relate to the potential exposure of each of those groups to the material. To the best of our knowledge, the information contained herein is accurate. However, neither Celanese Canada, Incorporated nor any of its subsidiaries or affiliates assume any liability whatsoever for the accuracy or completeness of the information contained herein.

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ACETONE

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Material Safety Data Sheet
Issued September 1, 1995

Acetone (CCS-972)
#C-972

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Identification

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Product name: Acetone (CCS-972)
Chemical name: Acetone
Chemical family: Ketone
Formula: CH₃COCH₃
Molecular weight: 58
CAS number: 67-64-1
CAS name: Acetone
Synonyms: 2-Propanone, dimethyl ketone; DMK.
*Transportation of dangerous goods
Shipping name: Acetone
Classification: Flammable Liquid 3.
United Nations number: UN1090
Packing group: II

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Physical data

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Boiling point (760 mm Hg): 56.2 deg C (133 deg F)
Freezing point: -95.4 deg C (-140 deg F)
Specific gravity (H₂O = 1 @ 20/20 deg C): 0.7910
Vapor pressure (20 deg C): 180 mm Hg
Vapor density (Air = 1 @ 20 deg C): 2.0
Solubility in water (% by WT @ 20 deg C): Complete
Percent volatiles by volume: 100
Evaporation rate (BuAc=1): 14.5
Appearance and odor: Clear, colorless, mobile liquid with characteristic
"ketone" odor.

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Component information (See Glossary at end of MSDS for definitions)

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Component, wt. % (CAS number)	Exposure levels		
	OSHA PEL TWA; STEL	ACGIH TLV(R) TWA; STEL	IDLH
- Acetone, 99.9% (67-64-1)	750 ppm; 1000 ppm	750 ppm; 1000 ppm	20,000 ppm

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ACETONE

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Fire and explosion hazard data

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Flammable limits in air, % by volume

Upper: 13.0

Lower: 2.5

Flash point (test method):

Tag open cup (ASTM D1310): 0 deg F (-18 deg C)

Tag closed cup (ASTM D56): -4.0 deg F (-20 deg C)

Extinguishing media:

Use CO2 or dry chemical for small fires, alcohol-type aqueous film-forming foam or water spray for large fires. Water may be ineffective but should be used to cool fire-exposed structures and vessels.

Special fire-fighting procedures:

*If potential for exposure to vapors or products of combustion exists, wear complete personal protective equipment, including self-contained breathing apparatus with full facepiece operated in pressure-demand or other positive-pressure mode.

Water spray can be used to reduce intensity of flames and to dilute spills to nonflammable mixture.

Unusual fire and explosion hazards:

Vapor is heavier than air and can travel considerable distance to a source of ignition and flashback.

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Special hazard designations

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	NFPA	Key	
	----	---	
Health:	1	0 - Minimal	3 - Serious
Flammability:	3	1 - Slight	4 - Severe
Reactivity:	0	2 - Moderate	

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Reactivity data

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Stability:

Stable

Hazardous polymerization:

Will not occur.

Conditions to avoid:

Heat, sparks and flame.

Materials to avoid:

Caustic soda and other strong alkalis; hydrochloric, sulfuric and other strong inorganic acids; amines; oxidizing agents such as hydrogen peroxide, nitric acid, perchloric acid or chromium trioxide.

Hazardous combustion or decomposition products:

Carbon monoxide.

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ACETONE

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Health data

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Effects of exposure/toxicity data

Acute

Ingestion (swallowing): Can cause mental sluggishness, stupor, headache; irritation of the mouth, throat and stomach; nausea, loss of appetite, and vomiting. Practically non-toxic to animals (oral LD50, rats: 7.4 g/kg).

Inhalation (breathing): Extremely high levels produce stupor, headache, dizziness, nausea and unconsciousness. Practically non-toxic to animals (inhalation LCLo, rats, 4 hrs: 16,000 ppm).

Skin contact: Essentially non-irritating. Prolonged or repeated contact can defat the skin and produce dermatitis. Slightly toxic to animals by absorption (dermal LD50, rabbits: 20 g/kg).

Eye contact: Can cause severe injury - damage reversible.

Chronic

Mutagenicity: In vitro, no evidence of mutagenicity in Ames test (bacteria).
In vivo, no evidence of mutagenicity.

Carcinogenicity: No evidence of skin tumors resulting from application three times weekly over a one-year period (mice).

Reproduction: No information.

Medical conditions aggravated by exposure:

Significant exposure to this chemical may adversely affect people with chronic disease of the respiratory system, and/or skin.

Emergency and first aid procedures

Ingestion (swallowing): Induce vomiting of conscious patient immediately by giving two glasses of water and pressing finger down throat. Contact a physician immediately.

Inhalation (breathing): Remove patient from contaminated area. If breathing has stopped, give artificial respiration, then oxygen if needed. Contact a physician immediately.

Skin contact: Remove contaminated clothing and wash contaminated skin with large amounts of water. If irritation persists, contact a physician.

Eye contact: Flush eyes with water for at least 15 minutes. Contact a physician immediately.

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Spill or leak procedures

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*Steps to be taken if material is released or spilled:

Eliminate ignition sources. Avoid eye or skin contact; see "Special protection information" section for respirator information. Place leaking containers in well-ventilated area with spill containment. If fire potential exists, blanket spill with alcohol-type aqueous film-forming foam or use water spray to disperse vapors. Contain spill to facilitate clean-up. Clean-up methods may include absorbent materials,

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ACETONE

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vacuum truck, etc. Avoid runoff into storm sewers and ditches which lead to natural waterways.

*Waste disposal method:

All notification, clean-up and disposal should be carried out in accordance with federal, provincial and local regulations. Preferred methods of waste disposal are incineration or biological treatment in federal/provincial approved facility.

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Special protection information

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*Respiratory protection:

Based on contamination level and working limits of the respirator, use a respirator approved by NIOSH/MSHA (the following are the minimum recommended equipment).

For acetone concentrations of:

> or = 750 ppm and < or = 2000 ppm - Air-purifying respirator with full facepiece and organic vapor cartridge(s) or air-purifying full facepiece respirator with an organic vapor canister or a full face-piece powered air-purifying respirator fitted with organic vapor cartridge(s).
>2000 ppm and <20,000 ppm - Positive-pressure full facepiece supplied-air respirator, or continuous-flow full face-piece supplied-air respirator.
> or = 20,000 ppm or unknown concentration (such as in emergencies) - Positive-pressure self-contained breathing apparatus with full facepiece. Positive-pressure supplied-air respirator with full facepiece equipped with an auxiliary positive-pressure self-contained breathing apparatus escape system.

Ventilation

Local exhaust: Recommended when appropriate to control employee exposure.

Mechanical (general): Not recommended as the sole means of controlling employee exposure.

Protective gloves:

Neoprene or rubber.

Eye protection:

Chemical safety goggles.

*Additional protective equipment:

For operations where spills or splashing can occur, use chemical protective clothing, including gloves and boots. A safety shower and eye bath should be readily available.

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Special precautions

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*Precautions to be taken in handling and storing:

Closed containers exposed to temperatures above 49 deg C (120 deg F) in transit or storage may develop excessive vapor pressure. Always open containers slowly to allow any excess pressure to vent.

Store in a cool, well-ventilated area. Keep away from heat, sparks and flame. Keep containers closed when not in use. Use spark-resistant

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ACETONE

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tools. Do not load into compartments adjacent to heated cargo. When transferring follow proper grounding procedures. Use with adequate ventilation. Avoid breathing vapor. Avoid contact with eyes, skin and clothing. Wash thoroughly with soap and water after handling. Decontaminate soiled clothing thoroughly before re-use. Discard contaminated leather clothing.

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WHMIS classification

Class B, Division 2; Class D, Division 2, Subdivision B.

Prepared by: Industrial Hygiene Department

Date: September 1, 1995

*New or revised information; previous
version dated September 1, 1993.

*Glossary for Components information table

ACGIH - American Conference of Governmental Industrial Hygienists

CAS - Chemical Abstracts Service

Ceiling - The concentration that should not be exceeded during any part of
the working day.

IDLH - Immediately Dangerous to Life or Health

OSHA - Occupational Safety and Health Administration (USA)

PEL - Permissible exposure limit

Skin - Potential contribution to overall exposure possible
via skin absorption

STEL - Short-term exposure level; 15-min. TWA

TLV - Threshold limit value

TWA - 8-hour time-weighted average

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ACETYLENE

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* M S D S *

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* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 1079773

PRODUCT NAME(S) : Acetylene

Acetylen, Ethine, Ethyne, Narcylene

PRODUCT IDENTIFICATION : CAS NO. 74-86-2

E-4559-G

DATE OF MSDS : 1995-11-01

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Praxair Products Inc

ADDRESS : 1 City Centre Drive

Suite 1200

Mississauga Ontario

Canada L5B 1M2

EMERGENCY TELEPHONE NO. : 800-363-0042

Message from Praxair Products Inc: Praxair Products Inc. requests the users of this product to study this Material Safety Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety information, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information. The opinions expressed herein are those of qualified experts within Praxair Products Inc. We believe that the information contained herein is current as of the date of the Material Safety Data Sheet. Since the use of this information and these opinions and the conditions of use of the product are not within the control of Praxair Products Inc., is it the user's obligation to determine the conditions of safe use of the product.

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : Praxair Products Inc

ADDRESS : 1 City Centre Drive

Suite 1200

Mississauga Ontario

Canada L5B 1M2

Telephone: 905-803-1600

Fax: 905-803-1690

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ACETYLENE

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MATERIAL SAFETY DATA SHEET

E-4559-G

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I. PRODUCT INFORMATION

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PRODUCT IDENTIFIER: Acetylene
TRADE NAME: Acetylene
CHEMICAL IDENTITY: Acetylene
SYNONYMS: Acetylen, Ethine, Ethyne, Narcylene
FORMULA: C₂H₂
CHEMICAL FAMILY: Alkyne
WHMIS CLASS: A, B1, F
PRODUCT USE: Welding and cutting
SHIPPING NAME: Acetylene
UN/NA #: UN 1001
TDG CLASSIFICATION: 2.1

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II. HAZARDOUS INGREDIENTS

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INGREDIENTS	% (VOL)	CAS NO.
Acetylene	100	74-86-2

LD50 (SPECIES & ROUTE): Not applicable
LC50 (Rat, 4 hrs.): Not available
TLV (ACGIH)*: Simple asphyxiant (See Section VI)

* Applicable provincial TLVs may differ.

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III. PHYSICAL DATA

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PHYSICAL STATE: GAS (X) LIQUID () SOLID ()
BOILING POINT, 760 mm Hg: Not applicable
SPECIFIC GRAVITY: Not applicable
VAPOUR DENSITY (air = 1): 0.91
% VOLATILES (BY VOLUME): 100
FREEZING POINT: Sublimation: -84 deg C
VAP. PRESS AT 20 DEG C: 635 psig
SOLUBILITY IN WATER (% BY WT): Slight
EVAPORATION RATE (BUTYL ACETATE=1): Not applicable
ODOUR THRESHOLD: 657 mg/m³
pH: Not applicable
MOLECULAR WEIGHT: 26.038
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable
APPEARANCE & ODOUR: Colourless gas at normal temperature and pressure;
garlic-like odour.

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ACETYLENE

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IV. FIRE OR EXPLOSION HAZARD

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FLAMMABLE: IF YES, UNDER WHAT CONDITIONS? See "Unusual Fire and
YES (X) NO () Explosion Hazards" in this section.

FLASH POINT (TEST METHOD):	AUTOIGNITION TEMPERATURE:
-17.8 deg C T.C.C.	299 deg C
FLAMMABLE LIMITS IN AIR, % BY VOLUME:	LOWER: 2.3%
	UPPER: 100%

EXTINGUISHING MEDIA: See paragraphs below

SPECIAL FIRE FIGHTING PROCEDURES:

Refer to CGA pamphlet SB-4, "Handling Acetylene Cylinders in Fire Situations". Evacuate all personnel from danger area. Immediately cool containers with water spray from maximum distance taking care not to extinguish flames. Remove ignition sources if without risk. If flames are accidentally extinguished, explosive re-ignition may occur. Use self-contained breathing apparatus. Stop flow of gas if without risk while continuing cooling water spray. Remove all containers from area of fire if without risk. Allow fire to burn out.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Extremely flammable gas. Forms explosive mixtures with air and oxidizing agents. Container may rupture due to heat of fire. Do not extinguish flames due to possibility of explosive re-ignition. Flammable vapours may spread from leak. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with approved explosion meter. No part of a container should be subjected to a temperature higher than 52 deg C (approximately 125 deg F). All containers are provided with a pressure relief device designed to vent contents when they are exposed to elevated temperature. Contact with copper, silver, or mercury or their alloys or halogens can cause explosion and be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge or other ignition sources at locations distant from product handling point.

HAZARDOUS COMBUSTION PRODUCTS: CO/CO2

SENSITIVITY TO IMPACT: Avoid impact against containers

SENSITIVITY TO STATIC DISCHARGE: Possible, See "Unusual fire and explosion hazards" section

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V. REACTIVITY DATA

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STABILITY	CONDITIONS OF CHEMICAL UNSTABILITY:
UNSTABLE STABLE	Stable as shipped. Avoid use at pressure
[X] []	above 15 psig.

INCOMPATIBLE PRODUCTS: Copper, silver, mercury or their alloys, oxidizing agents, acids, halogens, moisture.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition or burning may produce CO/CO2H2. The welding and cutting process may form reaction products such as carbon monoxide and carbon dioxide. Other decomposition products of normal operation originate from the volatilization, reaction or oxidation of the material being worked.

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ACETYLENE

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HAZARDOUS POLYMERIZATION:
MAY OCCUR WILL NOT OCCUR
[X] []

CONDITIONS OF REACTIVITY:
Elevated temperature and pressure and/or
the presence of catalyst.

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VI. TOXICOLOGICAL PROPERTIES

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LD50 (MIXTURE):
Not applicable

LC50 (MIXTURE):
Not applicable

ROUTE OF EXPOSURE:

SWALLOWING	SKIN ABSORPTION	INHALATION	SKIN CONTACT	EYE CONTACT
(X)	()	(X)	(X)	(X)

EFFECTS OF SINGLE (ACUTE) OVEREXPOSURE:

SWALLOWING: An unlikely route of exposure, but frostbite of the lips and mouth may result from contact with the liquid. If the liquid is swallowed, may cause nausea.

SKIN ABSORPTION: No evidence of adverse effects from available information.

INHALATION: Asphyxiant. Moderate concentrations of vapour may cause headache, drowsiness, dizziness, nausea, vomiting, excitation, excess salivation, and unconsciousness.

SKIN CONTACT: No harmful effects expected from vapour. Liquid may cause frostbite.

EYE CONTACT: Vapour may cause irritation. Liquid may cause irritation and frostbite.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: NOTE: Acetylene cylinders are filled with a porous material containing acetone into which the acetylene is dissolved. ACGIH has established a TLV-TWA of 750 PPM for acetone and a STEL of 1000 PPM.

WORKING WITH WELDING AND CUTTING MAY CREATE ADDITIONAL HEALTH HAZARDS.

FUMES AND GASES can be dangerous to your health and may cause serious lung disease. Keep your head out of the fumes. Do not breathe fumes and gases caused by the process. Use enough ventilation, local exhaust, or both to keep fumes and gases from your breathing zone and the general area. The type and amount of fumes and gases depend on the equipment and supplies used. Possibly dangerous materials may be found in fluxes, coatings, gases, metals etc. Get a Material Safety Data Sheet (MSDS) for every material used. Air samples can be used to find out what respiratory protection is needed. Short term overexposure to fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of nose, throat, eyes.

NOTES TO PHYSICIAN:

ACUTE: Gases, fumes, and dusts may cause irritation to the eyes, lungs, nose, and throat. Some toxic gases associated with welding and related processes may cause pulmonary edema, asphyxiation, and death. Acute overexposure may include signs and symptoms such as watery eyes, nose and throat irritation, headache, difficulty breathing frequent coughing, or chest pains.

CHRONIC: Protracted inhalation of air contaminants may lead to their

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ACETYLENE

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accumulation in the lungs, a condition which may be seen as dense areas on chest x-rays. The severity of change is proportional to the length of exposure. The changes seen are not necessarily associated with symptoms or signs of reduced lung function or disease. In addition, the changes on x-rays may be caused by non-work related factors such as smoking, etc.

OTHER EFFECTS OF OVEREXPOSURE: None

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: None

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION:

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VII. PREVENTATIVE MEASURES

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PERSONAL PROTECTION:

RESPIRATORY PROTECTION: Use respirable fume respirator or air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select in accordance with the provincial regulations or guidelines. Selection should also be based on the current CSA standards Z94.4, "Selection, care and use of respirators". Respirators should be approved by NIOSH and MSHA.

PROTECTIVE GLOVES: Welding gloves recommended.

EYE PROTECTION: Wear goggles with filter lens selected as per ANSI Z49.1. Provide protective screens and goggles, if necessary. Select in accordance with the current CSA Standard Z94.3, "Industrial eye and face protection", and any provincial regulations or guidelines.

OTHERS: As needed, wear hand, head, and body protection which help to prevent injury from radiation and sparks. See ANSI Z49.1. At a minimum this includes welder's gloves and protective goggles, and may include arm protectors, aprons, hats, shoulder protection, as well a substantial clothing. Train the worker not to touch live electrical parts.

SPECIFIC ENGINEERING CONTROL:

VENTILATION: LOCAL EXHAUST: Use enough ventilation, local exhaust or both, to keep the fumes and gases below TLV's in the worker's breathing zone and the general area. Train the worker to keep his head out of the fumes.

MECHANICAL: ALWAYS WORK WITH ENOUGH VENTILATION

SPECIAL: Not applicable

OTHERS: Depends on specific use conditions and location. Use adequate ventilation or personal respiratory protection.

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Forms explosive mixtures with air (See Section IV). Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Remove all sources of ignition if without risk. Reduce vapours with fog or fine water spray. Shut off leak if without risk. Ventilate area of leak or move leaking container to well-ventilated area.

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ACETYLENE

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Flammable gas may spread from leak. Before entering area, especially confined areas, check atmosphere with appropriate device.

WASTE DISPOSAL METHOD:

Prevent waste from contaminating surrounding environment. Keep personnel away. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with Federal, Provincial and local regulations.

SPECIAL HANDLING AND STORAGE REQUIREMENTS:

Fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being worked, the process, procedure and electrodes used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being worked (such as paint, plating, or galvanizing), the respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapours from cleaning and degreasing activities). One recommended way to determined the composition and quantity of fumes and gases to which workers are exposed is to take an air sample from inside the worker's helmet if worn or in the worker's breathing zone. Read and understand the manufacturer's instructions and the precautionary label on the product. See American National Standard Z49.1, "Safety In Welding And Cutting" published by the American Welding Society.

MIXTURES:

When two or more gases, or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist, or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

OTHER HANDLING AND STORAGE CONDITIONS:

Heat and sparks during use could be the source of ignition of combustible materials. Prevent fires. Refer to NFPA 51B "Cutting and Welding Processes" and NFPA 50 "Oxygen-Fuel Gas Systems." Use piping and equipment adequately designed to withstand pressures to be encountered. Gas can cause rapid suffocation due to oxygen deficiency. Store and use with adequate ventilation. Close valve when not in use and when empty. Never work on a pressurized system. Do not strike arc on cylinder . The defect produced by an arc burn could lead to cylinder rupture. Do not ground cylinder. Store in cool, dry, well ventilated area. Do not store near open flames. Electrical equipment should be explosion proof. Do not store with oxygen or other oxidizers. Protect cylinders from physical damage. Store cylinders in upright position secured to prevent falling over. Refer to CGA Pamphlets P-1 and G-1 for recommendations.

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ACETYLENE

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VIII. FIRST AID MEASURES

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SWALLOWING: If liquid is swallowed, do not induce vomiting. Call physician.
SKIN CONTACT: For exposure to liquid, flush with water and warm frostbite area with warm water (not to exceed 40 deg C). In case of massive exposure, remove clothing while showering with warm water. Call a physician.

INHALATION: Remove to fresh air. If breathing has stopped, give artificial respiration; if breathing is difficult, oxygen may be given; call a physician.

EYE CONTACT: In case of splash contamination, immediately flush eyes thoroughly with water for at least 15 minutes. Seek the advice of a physician, preferably an ophthalmologist, urgently.

NOTE TO PHYSICIAN: Aspirated acetone may cause severe lung damage. If a large quantity of material has been swallowed, stomach contents should be evacuated quickly in a manner which avoids aspiration. Otherwise, treatment should be directed at the control of symptoms and the clinical condition. No specific antidote is known.

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IX. PREPARATION INFORMATION

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DEPARTMENT	DATE	TELEPHONE
Safety and Environmental Services	Nov. 1, 1995	(905) 803-1600

Copyright (C) 1995, Praxair Products Inc.

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ALKYD FLAT PAINT

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* M S D S *

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* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2131575

PRODUCT NAME(S) : Industrial Maintenance Sweep-Up Spray
Alkyd Flat

PRODUCT IDENTIFICATION : PLANT CODE: M51-01 White

DATE OF MSDS : 1997-03

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 1999-09-29

*** MANUFACTURER INFORMATION ***

MANUFACTURER : BENJAMIN MOORE & COMPANY LIMITED

ADDRESS : 139 MULOCK AVENUE
TORONTO ONTARIO
CANADA M6N 1G9
Telephone: 416-766-1173
Fax: 416-766-9677

I. PRODUCT INFORMATION

MANUFACTURER: BENJAMIN MOORE & COMPANY LIMITED
139 MULOCK AVENUE
TORONTO. ONTARIO, M6N 1G9

TELEPHONE: (416) 766-1173 **FAX:** (416) 766-9677

TRADE NAME: Industrial Maintenance Sweep-Up Spray Alkyd Flat

PLANT CODE: M51-01 White

SYNONYMS: not applicable **CHEMICAL NAME:** not applicable

MOL. FORMULA: not applicable **C.A.S. NUMBER:** not applicable

GENERIC NAME: Alkyd paint

PRODUCT USE: Finish coat

TRANSPORT OF DANGEROUS GOODS:

SHIPPING NAME: Paint

CLASSIFICATION: 3.2 **PIN** 1263 **PACKING GROUP:** III

WHMIS CLASSIFICATION: B2, Flammable Liquid; D2 Other Toxic Effects

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ALKYD FLAT PAINT

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II HAZARDOUS INGREDIENTS

INGREDIENT	CAS NUMBER	%WT	TLV	LD50/LC50
V.M. & P. Naphtha (UN1268)	64742-89-8	10 - 30	300 ppm	not established
Aliphatic Hydrocarbon (UN1255)	64742-47-8	15 - 40	100 ppm	oral >8 g/kg rat
Methyl Styrene (UN2618)	25013-15-4	0.1 - 1.0	100 ppm	oral 4 g/kg rat

=====

III PHYSICAL DATA

The following physical data are approximate only and do not represent specification values. They should only be used in the context of this Material Safety Data Sheet.

BOILING RANGE (deg C): 113 - 199 SPECIFIC GRAVITY (20 deg C): 1.55-1.64
VAPOUR PRESSURE (kPa): >1.3 @38 deg C VAPOUR DENSITY (air = 1): > 1
WATER SOLUBILITY: Negligible VOLATILITY (% by vol): 50 - 55
FREEZING POINT (deg C): < -18 ODOUR THRESHOLD: not known
OIL/WATER DISTRIBUTION COEFFICIENT: Not known pH: not applicable
EVAPORATION RATE (butyl acetate = 1): < 1 PHYSICAL STATE: Liquid
APPEARANCE & ODOUR: Thick white liquid with petroleum odour.

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IV FIRE & EXPLOSION HAZARDS

FLASH POINT (deg C): 20.5 METHOD: TCC
FLAMMABLE LIMITS (% in air); LOWER: 0.6 UPPER: 7.0
AUTOIGNITION TEMPERATURE (deg C): Not known
FLAMMABILITY CLASSIFICATION: Combustible Liquid
EXTINGUISHING MEDIA: Use foam, dry chemical or water spray
FIRE FIGHTING PROCEDURES:

Respiratory and eye protection required by fire fighting personnel.
Avoid spraying water directly onto the product as this will only spread the fire.

FIRE & EXPLOSION HAZARD:

Sealed containers may explode if they become overheated in a fire.
Cool containers with a water mist or fog. Not sensitive to static discharge or mechanical impact.

HAZARDOUS COMBUSTION PRODUCTS:

Hazardous combustion products may include oxides of carbon, nitrogen

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ALKYD FLAT PAINT

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and sulphur and smoke.

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V. REACTIVITY

LEVEL OF STABILITY: Stable

CONDITIONS TO AVOID: None.

INCOMPATIBILITY: Avoid oxidizing agents, strong acids and strong bases.

HAZARDOUS DECOMPOSITION PRODUCTS: May produce oxides of carbon and nitrogen.

HAZARDOUS POLYMERIZATION: Will not occur.

POLYMERIZING AGENTS TO AVOID: None.

=====

VI. TOXICOLOGICAL PROPERTIES

THRESHOLD LIMIT VALUE: 100 ppm (for solvent)

EFFECTS OF EXPOSURE:

High vapour concentrations are irritating to the eyes, nose, throat and lungs; may cause headaches and dizziness; anaesthetic effect may cause other central nervous system effects ultimately leading to breathing failure and death. The product will cause eye irritation but is not expected to cause tissue injury. Repeated or prolonged exposure may cause irritation of the skin and possibly dermatitis. Low toxicity through skin absorption. While oral toxicity is minimal, small amounts of this product aspirated into the lungs may cause severe health effects such as bronchopneumonia, pulmonary edema and death.

TOXICOLOGICALLY SYNERGISTIC PRODUCTS: None known.

OTHER HEALTH HAZARDS:

Possible chronic effects include kidney damage and/or disorders as observed in rats. A number of human studies have not shown clinical evidence of an association between the exposure to the solvent and disease. Methyl styrene has been reported as an experimental teratogen. None of the ingredients are listed as sensitizers, carcinogens, reproductive toxins, or mutagens.

AQUATIC TOXICITY: Not available

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VII. EMERGENCY FIRST AID

In case of inhalation, remove victim to fresh air and administer artificial respiration if breathing has stopped. Obtain medical assistance immediately. In case of contact with eyes, flush with large amounts of water until irritation subsides. If irritation persists, obtain medical attention. For contact with skin, flush with large amounts of cold water. Use soap if available. Remove contaminated clothing after flush has begun. If ingested, do NOT

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ALKYD FLAT PAINT

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induce vomiting. Keep at rest and obtain medical attention immediately.

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VIII. PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT:

Use NIOSH approved respirator specified for protection against paint spray mist and organic vapours in restricted and confined areas. Wear coverall chemical goggles to protect against splashes. Wear solvent resistant gloves to protect hands.

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED:

Dike spill. Do NOT flush into sewers. Remove all sources of ignition and only use non-sparking tools. Absorb with inert material.

WASTE DISPOSAL METHODS:

Dispose of in accordance with local regulations.

STORAGE AND HANDLING:

Keep container closed when not using product. Store in a cool, well ventilated area, away from all sources of ignition.

SPECIAL ENGINEERING CONTROLS: None.

SPECIAL SHIPPING INFORMATION: Generic Supplier Label C

SPECIAL INFORMATION: None

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IX. PREPARTION INFORMATION

REGULATORY AFFAIRS DEPARTMENT
BENJAMIN MOORE & COMPANY LIMITED

March 1997
.CHRID 0069700037

(416) 766-1173

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AMMONIUM NITRATE

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2454125

PRODUCT NAME(S) : AMMONIUM NITRATE

PRODUCT IDENTIFICATION : MSDS NUMBER: A6048

PRODUCT CODE: 0729, 0731, 3436

C.A.S. NUMBER: 6484-52-2

DATE OF MSDS : 1999-11-17

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-11-14

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Mallinckrodt Baker, Inc

ADDRESS : 222 RED SCHOOL LANE

PHILLIPSBURG NEW JERSEY

U.S.A. 08865

Telephone: 800-582-2537 (Customer
Service)

EMERGENCY TELEPHONE NO. : 908-859-2151

800-424-9300 (CHEMTREC, USA)

703-527-3887 (Outside USA & CANADA)

613-996-6666 (CANUTEC)

*** MATERIAL SAFETY DATA ***

Effective Date: 11/17/99

Supercedes: 12/08/96

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MSDS MATERIAL SAFETY DATA SHEET CHEMTREC: 800-424-9300 (USA)

==== ----- 703-527-3887

From: Mallinckrodt Baker, Inc. (Outside USA & CANADA)

222 Red School Lane CANUTEC: 613-996-6666

Phillipsburg, NJ 08865

Emergency Telephone Number: 908-859-2151

NOTE: Use CHEMTREC and CANUTEC
phone numbers only in the event
of a chemical emergency.

All non-emergency questions should be directed to Customer Service
(1-800-582-2537) for assistance.

J. T. B A K E R

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AMMONIUM NITRATE

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1. Product Identification

Synonyms: Nitric acid, ammonium salt
CAS No: 6484-52-2
Molecular Weight: 80.04
Chemical Formula: NH₄NO₃
Product Codes: J.T. Baker:
0729, 0731
Mallinckrodt:
3436

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2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Ammonium Nitrate	6484-52-2	99 - 100%	Yes

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3. Hazards Identification

Emergency Overview

DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE OR EXPLOSION. MAY BE HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 0 - None
Reactivity Rating: 3 - Severe (Oxidizer)
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Yellow (Reactive)

Potential Health Effects

Inhalation:

May cause irritation to the respiratory tract; symptoms may include coughing, sore throat, and shortness of breath. At high temperatures, exposure to toxic nitrogen oxides decomposition products can quickly cause acute respiratory problems. Inhalation of large amounts causes systemic acidosis and abnormal hemoglobin.

Ingestion:

Large oral doses of nitrates may cause dizziness, abdominal pain, vomiting, bloody diarrhea, weakness, convulsions, and collapse. Harmful if swallowed. May cause methemoglobinemia resulting in cyanosis.

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AMMONIUM NITRATE

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Skin Contact:

Causes irritation to skin. Symptoms include redness, itching, and pain.

Eye Contact:

Causes irritation, redness, and pain.

Chronic Exposure:

Small repeated oral doses of nitrates may cause weakness, depression, headache, and mental impairment.

Aggravation of Pre-existing Conditions:

No information found.

=====

4. First Aid Measures

Inhalation:

Remove to fresh air. Get medical attention for any breathing difficulty.

Ingestion:

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.

Eye Contact:

Wash thoroughly with running water. Get medical advice if irritation develops.

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5. Fire Fighting Measures

Fire:

Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. May support combustion in an existing fire.

Explosion:

Contact with oxidizable substances may cause extremely violent combustion. Sealed containers may rupture when heated. Sensitive to mechanical impact.

Fire Extinguishing Media:

Use flooding amounts of water in early stages of fire involving ammonium nitrate. Use any means suitable for extinguishing surrounding fire.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved

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AMMONIUM NITRATE

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self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

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6. Accidental Release Measures

Remove sources of heat and ignition.

Collected waste may be transferred to a closed, preferably metal, container and sent to a RCRA approved waste disposal facility.

Alternatively, sweep spill into noncombustible container and dissolve in large amount of water. Add soda ash. Mix and neutralize with 6M-HCl.

Neutralized sludge may be sent to an approved waste disposal facility.

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7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Protect against physical damage. Store in a dry location separate from combustible, organic or other readily oxidizable materials. Avoid storage on wood floors. Remove and dispose of any spilled dichromates; do not return to original containers. Do not store above 54C (130F) preferably below 30C (86F). Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

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8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

None established.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

Personal Respirators (NIOSH Approved):

For conditions of use where exposure to the dust or mist is apparent, a half-face dust/mist respirator may be worn. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear protective gloves and clean body-covering clothing.

Eye Protection:

Use chemical safety goggles. Maintain eye wash fountain and quick-drench

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AMMONIUM NITRATE

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facilities in work area.

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9. Physical and Chemical Properties

Appearance:	Boiling Point:
Colorless crystals.	210C (410F) Decomposes.
Odor:	Melting Point:
Odorless.	170C (338F)
Solubility:	Vapor Density (Air=1):
118g/100g water @ 0C (32F).	No information found.
Specific Gravity:	Vapor Pressure (mm Hg):
1.73 @ 23C (77F)	No information found.
pH:	Evaporation Rate (BuAc=1):
5.4	No information found.

% Volatiles by volume @ 21C (70F): 0

=====

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Hygroscopic.

Hazardous Decomposition Products:
Emits nitrous oxides when heated to decomposition. Liberates ammonia in reaction with strong alkalis.

Hazardous Polymerization:
Will not occur.

Incompatibilities:
Aluminum, antimony, chromium, copper, iron, lead, magnesium, manganese, nickel, zinc, brass, oil, charcoal, organic material, acetic acid, ammonium chloride, bismuth, cadmium, chlorides, cobalt, phosphorus, potassium and ammonium sulfate, sodium, sodium hypochlorite, sodium perchlorate, sodium-potassium alloy, and sulfur.

Conditions to Avoid:
Heat, flame, ignition sources, dusting and incompatibles. Moisture and combustible materials. Shock sensitive.

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AMMONIUM NITRATE

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11. Toxicological Information

Oral rat LD50: 2217 mg/kg.

-----\Cancer Lists\-----

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Ammonium Nitrate (6484-52-2)	No	No	None

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12. Ecological Information

Environmental Fate:

When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is not expected to evaporate significantly. When released into water, this material is expected to readily biodegrade.

Environmental Toxicity:

No information found.

=====

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations.

Dispose of container and unused contents in accordance with federal, state and local requirements.

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14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: AMMONIUM NITRATE

Hazard Class: 5.1

UN/NA: UN1942

Packing Group: III

Information reported for product/size: 300LB

International (Water, I.M.O.)

Proper Shipping Name: AMMONIUM NITRATE

Hazard Class: 5.1

UN/NA: UN1942

Packing Group: III

Information reported for product/size: 300LB

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AMMONIUM NITRATE

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----				
Ingredient	TSCA	EC	Japan	Australia
Ammonium Nitrate (6484-52-2)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----				
Ingredient	Korea	DSL	NDSL	Phil.
Ammonium Nitrate (6484-52-2)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----				
Ingredient	-SARA 302- RQ	TPQ	-----SARA 313----- List	Chemical Catg.
Ammonium Nitrate (6484-52-2)	No	No	No	Nitrate compd

-----\Federal, State & International Regulations - Part 2\-----			
Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Ammonium Nitrate (6484-52-2)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
 SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
 Reactivity: Yes (Pure / Solid)
 Australian Hazchem Code: 1[S]
 Australian Poison Schedule: No information found.
 WHMIS: This MSDS has been prepared according to the hazard
 criteria of the Controlled Products Regulations (CPR) and
 the MSDS contains all of the information required by the
 CPR.

16. Other Information

NFPA Ratings:
 Health: 2 Flammability: 0 Reactivity: 3 Other: Oxidizer

Label Hazard Warning:
 DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE OR
 EXPLOSION. MAY BE HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO
 SKIN, EYES AND RESPIRATORY TRACT.

Label Precautions:
 Keep from contact with clothing and other combustible materials.
 Do not store near combustible materials.
 Store in a tightly closed container.
 Avoid breathing dust.
 Avoid contact with eyes, skin and clothing.
 Remove and wash contaminated clothing promptly.
 Use only with adequate ventilation.

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AMMONIUM NITRATE

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Wash thoroughly after handling.
Store preferably below 30C

Label First Aid:

If inhaled, remove to fresh air. Get medical attention for any breathing difficulty. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In all cases, get medical attention.

Product Use:

Laboratory Reagent.

Revision Information:

No changes.

Disclaimer:

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Prepared by: Strategic Services Division
Phone Number: (314) 654-1600 (U.S.A.)

A6048

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Automatic Transmission Fluid (ATF)

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2314190

PRODUCT NAME(S) : BP AUTRAN ATF + 3
AUTOMATIC TRANSMISSION FLUID; ATF;
LUBRICATING OIL

PRODUCT IDENTIFICATION : MSDS No. 12752 US/ENGLISH
CAS NUMBER: 72623-86-0

DATE OF MSDS : 2000-01-11

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-05-31

*** MANUFACTURER INFORMATION ***

MANUFACTURER : BP Lubricants

ADDRESS : 28100 Torch Parkway
Warrenville Illinois
U.S.A. 60555-4015
Telephone: 630-434-6377 (OTHER PRODUCT
SAFETY INFORMATION)

EMERGENCY TELEPHONE NO. : 312-856-2200 (HEALTH INFORMATION, USA)
703-527-3887 (SPILL INFORMATION,
CHEMTREC, USA)

*** MATERIAL SAFETY DATA ***

BP AUTRAN ATF + 3

MATERIAL SAFETY DATA SHEET

BP AUTRAN ATF + 3

MSDS No. 12752 US/ENGLISH

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Automatic Transmission Fluid (ATF)

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SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER/SUPPLIER:	EMERGENCY HEALTH INFORMATION:
BP Lubricants	1 (800) 447-8735
28100 Torch Parkway	
Warrenville, Illinois 60555-4015	EMERGENCY SPILL INFORMATION:
U.S.A.	
	1 (800) 424-9300 CHEMTREC (USA)
	OTHER PRODUCT SAFETY INFORMATION:
	1 (630) 434-6377 (USA)

SUBSTANCE: BP AUTRAN ATF + 3

TRADE NAMES/SYNONYMS:
AUTOMATIC TRANSMISSION FLUID; ATF; LUBRICATING OIL

CREATION DATE: Jan 11 2000
REVISION DATE: Jan 21 2000

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: HYDROTREATED NEUTRAL OIL-BASED LUBRICATING OIL
CAS NUMBER: 72623-86-0
EC NUMBER (EINECS): 276-737-9
PERCENTAGE: 77.0-87.0

COMPONENT: POLYALKYL METHACRYLATE
CAS NUMBER: Not assigned.
EC NUMBER: Not assigned.
PERCENTAGE: 2.6-13.0

COMPONENT: MEDIUM ALIPHATIC SOLVENT NAPHTHA
CAS NUMBER: 64742-88-7
EC NUMBER (EINECS): 265-191-7
PERCENTAGE: 1.0-7.0

(See Section 8, "Exposure Controls, Personal Protection", for exposure guidelines)

SECTION 3 HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=1 REACTIVITY=0

EMERGENCY OVERVIEW:
COLOR: red
PHYSICAL FORM: oil
ODOR: hydrocarbon odor
MAJOR HEALTH HAZARDS: Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.

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Automatic Transmission Fluid (ATF)

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POTENTIAL HEALTH EFFECTS:

INHALATION:

High vapor concentrations can cause headaches, dizziness, drowsiness, and nausea, and may lead to unconsciousness.

SKIN CONTACT:

Causes mild skin irritation. Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.

EYE CONTACT:

Causes mild eye irritation.

INGESTION:

Ingestion causes gastrointestinal irritation and diarrhea.

SECTION 4 FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

SKIN CONTACT: Wash exposed skin with soap and water. Remove contaminated clothing and thoroughly clean and dry before reuse. Get medical attention if irritation develops.

EYE CONTACT: Flush eyes with plenty of water. Get medical attention if irritation persists.

INGESTION: If swallowed, drink plenty of water. Get immediate medical attention. Induce vomiting only at the instructions of a physician. Do not give anything by mouth to unconscious or convulsive person.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Slight fire hazard.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical, regular foam, water

FIRE FIGHTING: Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Water or foam may cause frothing.

FIRE FIGHTING PROTECTIVE EQUIPMENT: Firefighters should wear full bunker gear, including a positive pressure self contained breathing apparatus.

FLASH POINT: >351 F (>177 C) (COC)

FLAMMABILITY CLASSIFICATION: Not Flammable.

HAZARDOUS COMBUSTION PRODUCTS:

Thermal decomposition products or combustion: aldehydes, hydrocarbons, oxides of carbon, oxides of calcium, oxides of sulfur, oxides of zinc

Automatic Transmission Fluid (ATF)

SECTION 6 ACCIDENTAL RELEASE MEASURES

Stop leak if possible without personal risk. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Keep unnecessary people away, isolate hazard area and deny entry. Large spills: Dike for later disposal. Cover with plastic sheet or tarp to minimize spreading and protect from contact with water. Prevent spreading by diking, ditching, or absorbing on inert materials.

SECTION 7 HANDLING AND STORAGE

STORAGE: Avoid extremes in storage temperatures. Store in a cool, dry, well-ventilated area. Store away from heat, ignition sources, and open flame in accordance with applicable regulations. Keep container tightly closed. Do not store in unlabeled containers.

HANDLING: Keep away from all ignition sources. Use only with adequate ventilation. Do not eat, drink or smoke in areas of use or storage. Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet facilities. Wash thoroughly after work using soap and water. Remove contaminated clothing and thoroughly clean and dry before reuse.

SPECIAL PRECAUTIONS: Empty containers may contain toxic, flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld, reuse or dispose of containers unless adequate precautions are taken against these hazards.

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

HYDROTREATED NEUTRAL OIL-BASED LUBRICATING OIL:

MINERAL OIL MIST:

5 mg/m3 OSHA TWA

5 mg/m3 ACGIH TWA (Notice of Intended Changes 1993-1994)

10 mg/m3 ACGIH STEL (Notice of Intended Changes 1993-1994)

5 mg/m3 MEXICO TWA

10 mg/m3 MEXICO STEL

MEDIUM ALIPHATIC SOLVENT NAPHTHA:

MINERAL OIL MIST:

5 mg/m3 OSHA TWA

5 mg/m3 ACGIH TWA (Notice of Intended Changes 1993-1994)

10 mg/m3 ACGIH STEL (Notice of Intended Changes 1993-1994)

5 mg/m3 MEXICO TWA

10 mg/m3 MEXICO STEL

VENTILATION: Use with adequate ventilation. Control airborne concentrations below the exposure guidelines.

EYE PROTECTION: Do not get in eyes. Wear eye protection.

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Automatic Transmission Fluid (ATF)

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CLOTHING: Avoid repeated or prolonged contact. Wear protective clothing if prolonged or repeated contact is likely.

GLOVES: Wear protective gloves if prolonged or repeated contact is likely.

PROTECTIVE MATERIAL TYPES: neoprene, nitrile butadiene rubber (NBR)

RESPIRATOR: Use with adequate ventilation.

Avoid breathing vapor or mist.

If ventilation is inadequate, use a NIOSH certified respirator with an organic vapor cartridge and P95 particulate filter.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid

COLOR: red

PHYSICAL FORM: oil

ODOR: hydrocarbon odor

BOILING POINT: Not available

FREEZING POINT: Not available

VAPOR PRESSURE: Not available

VAPOR DENSITY: Not available

SPECIFIC GRAVITY (water=1): 0.910 @ 16 C

BULK DENSITY: 0.910 g/cm³

WATER SOLUBILITY: Not available

PH: Not available

VOLATILITY: Not available

ODOR THRESHOLD: Not available

EVAPORATION RATE: slower than ether

VISCOSITY: 7.4-7.7 cSt @ 100 C

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Avoid contact with incompatible materials.

INCOMPATIBILITIES: strong oxidizing materials

HAZARDOUS DECOMPOSITION:

Thermal decomposition products or combustion: aldehydes, hydrocarbons, oxides of carbon, oxides of calcium, oxides of sulfur, oxides of zinc

POLYMERIZATION: Will not polymerize.

SECTION 11 TOXICOLOGICAL INFORMATION

EYE IRRITATION: Testing not conducted. See Other Toxicity Data.

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Automatic Transmission Fluid (ATF)

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SKIN IRRITATION: Testing not conducted. See Other Toxicity Data.

DERMAL LD50: Testing not conducted. See Other Toxicity Data.

ORAL LD50: Testing not conducted. See Other Toxicity Data.

INHALATION LC50: Testing not conducted. See Other Toxicity Data.

OTHER TOXICITY DATA:

Specific toxicity tests have not been conducted on this product. Our hazard evaluation is based on information from similar products, the ingredients, technical literature, and/or professional experience.

No component of this product present at levels greater than 0.1% is identified as a carcinogen by the U.S. National Toxicology Program, the U.S. Occupational Safety and Health Act, or the International Agency on Research on Cancer (IARC).

SECTION 12 ECOLOGICAL INFORMATION

Ecological testing has not been conducted on this product by BP Amoco.

SECTION 13 DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

SECTION 14 TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION: Not regulated.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS: Not regulated.

LAND TRANSPORT ADR/RID: Not regulated.

AIR TRANSPORT IATA/ICAO: Not regulated.

MARITIME TRANSPORT IMDG: Not regulated.

SECTION 15 REGULATORY INFORMATION

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR Part 302.4): This product is not reportable under 40 CFR Part 302.4.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR Part 355): This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA TITLE III SECTION 311/312 HAZARDOUS CATEGORIZATION (40 CFR Part 370):

ACUTE: N

CHRONIC: N

FIRE: N

REACTIVE: N

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Automatic Transmission Fluid (ATF)

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SUDDEN RELEASE: N

SARA TITLE III SECTION 313 (40 CFR Part 372): This product is not regulated under Section 313 of SARA and 40 CFR Part 372.

STATE REGULATIONS:

California Proposition 65: N

TSCA INVENTORY STATUS: Listed on inventory.

OSHA HAZARD COMMUNICATION STANDARD: Contains a component listed by ACGIH.
Contains a component listed by OSHA.

EC INVENTORY (EINECS/ELINCS): One or more components not listed on inventory.

JAPAN INVENTORY (MITI): Not determined.

AUSTRALIA INVENTORY (AICS): Not determined.

KOREA INVENTORY (ECL): Not determined.

CANADA INVENTORY (DSL): Listed on inventory.

PHILIPPINE INVENTORY (PICCS): Not determined.

CHINA INVENTORY (IECS): Not determined.

SECTION 16 OTHER INFORMATION

Prepared by: Product Stewardship and Toxicology

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This Material Safety Data Sheet conforms to the requirements of ANSI Z400.1.
NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

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COPPER SULPHATE

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2426887

PRODUCT NAME(S) : COPPER SULPHATE

DATE OF MSDS : 1999-11-17

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-09-27

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : CANADA COLORS AND CHEMICALS LIMITED

ADDRESS : 80 Scarsdale Road
Don Mills Ontario
Canada M3B 2R7
Telephone: 416-449-7750

EMERGENCY TELEPHONE NO. : 416-444-2112

SUPPLIER/DISTRIBUTOR NOTE :
For further information about this product please contact the Canada
Colors Customer Service Department at 416-449-7750.

*** MATERIAL SAFETY DATA ***

MATERIAL SAFETY DATA SHEET : 00004230

CANADA COLORS AND CHEMICALS LI
80 SCARSDALE ROAD
DON MILLS, ONTARIO M3B 2R7
(416) 449-7750

SECTION 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER..... CHEMARKETING INDUSTRIES INC.
2155 DUNWIN DRIVE, UNIT # 15
MISSISSAUGA, ONTARIO

L5L 4M1

PRODUCT NAME.....

PRODUCT CODE.....

CHEMICAL FORMULA..... CU.H2O4S.

CHEMICAL FAMILY..... INORGANIC.

MATERIAL USE..... REFER TO TECHNICAL LITERATURE.

EMERGENCY PHONE NO..... (416)-444-2112.

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COPPER SULPHATE

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SECTION 02: COMPOSITION/INFORMATION ON INGREDIENTS

%	CAS / TLV	LD/50, ROUTE, SPECIES	LC/50, ROUTE, SPECIES
COPPER SULPHATE			
100	7758-98-7 1.0 MG/M3	472 MG/KG (ORAL-RAT)	N.AV.

SECTION 03: HAZARDS IDENTIFICATION

ROUTE OF ENTRY:.....

SKIN CONTACT..... IRRITANT TO WET SKIN.

SKIN ABSORPTION..... NO.

EYE CONTACT..... CORROSIVE. EYE CORROSION WITH CORNEAL OR
CONJUNCTIVAL ULCERATION.

INHALATION..... CORROSIVE TO RESPIRATORY TRACT.

INGESTION..... SWALLOWING MAY BE FATAL.MAY CAUSE SEVERE
GASTROINTESTINAL TRACT IRRITATION.MAY
CAUSE ABDOMINAL PAIN.MAY CAUSE NAUSEA AND
VOMITING.

EFFECTS OF ACUTE EXPOSURE..... SEE ABOVE.

EFFECTS OF CHRONIC EXPOSURE..... CORROSIVE TO EYES AND RESPIRATORY
TRACT.DUST CAN COLOUR EXPOSED HAIR AND
FINGERNAILS.

MEDICAL CONDITIONS AGGRAVATED..... PREEXISTING EYE, SKIN AND RESPIRATORY
BY OVEREXPOSURE DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO
THIS PRODUCT.

SECTION 04: FIRST AID MEASURES

INSTRUCTIONS:..... IN CASE OF SKIN CONTACT.WASH SKIN WITH
SOAP AND WATER.REMOVE CONTAMINATED
CLOTHING.WASH CLOTHING AND DECONTAMINATE
SHOES BEFORE REUSE.OBTAIN MEDICAL
ATTENTION, IF IRRITATION PERSISTS.EYE
CONTACT: IMMEDIATELY FLUSH WITH LARGE
QUANTITIES OF WATER FOR AT LEAST 15
MINUTES AND CALL A PHYSICIAN.INHALATION:
REMOVE PATIENT TO FRESH AIR.OXYGEN MAY BE
GIVEN BY QUALIFIED PERSONNEL. SEEK MEDICAL
ATTENTION IF RESPIRATORY IRRITATION OCCURS
OR IF BREATHING IS DIFFICULT.IN CASE OF

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COPPER SULPHATE

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INGESTION: . RINSE MOUTH WITH WATER.GIVE
LARGE QUANTITIES OF WATER OR MILK.CONTACT
A PHYSICIAN, THE NEAREST HOSPITAL OF THE
NEAREST POISON CONTROL CENTRE. TELL THE
PERSON CONTACTED: THE COMPLETE PRODUCT
NAME, THE TYPE AND AMOUNT OF EXPOSURE,
DESCRIBE ANY SYMPTOMS AND FOLLOW THE
ADVICE GIVEN.IF VOMITING OCCURS KEEP HEAD
BELOW HIPS TO PREVENT ASPIRATION OF LIQUID
INTO THE LUNGS.IF VOMITING OCCURS, GIVE
FLUIDS AGAIN.

NOTES TO PHYSICIAN:..... N.AV.

SECTION 05: FIRE FIGHTING MEASURES

T.D.G. FLAM. CLASS..... NOT REGULATED.
FLAMMABILITY..... NOT FLAMMABLE.
IF YES, UNDER WHICH.....
CONDITIONS?
EXTINGUISHING MEDIA..... SUITABLE FOR SURROUNDING FIRE.
SPECIAL PROCEDURES..... FIREFIGHTERS SHOULD WEAR THE USUAL
PROTECTIVE GEAR; SELF-CONTAINED BREATHING
APPARATUS.

FLASH POINT (C), METHOD..... N.AP.
AUTO IGNITION TEMPERATURE..... N.AP.
UPPER FLAMMABLE LIMIT (% BY..... N.AP.
VOL.)
LOWER FLAMMABLE LIMIT (% BY..... N.AP.
VOL.)
EXPLOSION DATA.....
EXPLOSIVE POWER..... N.AV.
RATE OF BURNING..... N.AV.
SENSITIVITY TO STATIC..... N.AP.
DISCHARGE
SENSITIVITY TO IMPACT..... N.AP.
UNUSUAL FIRE AND EXPLOSION..... SEALED CONTAINERS MAY RUPTURE FROM
HAZARDS PRESSURE OF WATER VAPOUR RELEASED FROM
CRYSTALS BY INTENSE HEAT.AT TEMPERATURES
ABOVE APPROXIMATELY 110 (C), COPPER
SULPHATE WILL MELT AND FLOW.AVOID CONTACT
WITH DIRECT WATER STREAM AS THIS WILL
CAUSE SPLATTERING.
HAZARDOUS COMBUSTION PRODUCTS..... COPPER OXIDE. SULPHUR DIOXIDE.

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COPPER SULPHATE

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SECTION 06: ACCIDENTAL RELEASE MEASURES

LEAK/SPILL..... WEAR NIOSH/MSHA APPROVED RESPIRATOR
(SELF-CONTAINED BREATHING APPARATUS
PREFERRED) AND APPROPRIATE PROTECTIVE
EQUIPMENT.AVOID DUST ACCUMULATION.SWEEP,
SCOOP, OR VACUUM DISCHARGED
MATERIAL.COLLECT AND CONTAIN IN SUITABLE
DISPOSAL CONTAINERS.NEUTRALIZE. WASH AREA
WITH WATER.PREVENT RUNOFF INTO DRAINS,
SEWERS, AND OTHER WATERWAYS.

SECTION 07: HANDLING AND STORAGE

HANDLING PROCEDURES AND..... KEEP CONTAINER CLOSED WHEN NOT IN
EQUIPMENT USE.EMPTY PRODUCT CONTAINERS MAY CONTAIN
PRODUCT RESIDUE.FOLLOW LABELED WARNINGS
EVEN AFTER CONTAINER IS EMPTIED.DO NOT
SWALLOW.AVOID CONTACT WITH EYES, SKIN, AND
CLOTHING.AVOID CHRONIC INHALATION OF
DUST.AVOID EATING AND DRINKING IN USE.WEAR
PROTECTIVE EQUIPMENT DURING HANDLING.USE
WITH ADEQUATE VENTILATION.MAINTAIN A GOOD
PERSONAL HYGIENE.

STORAGE NEEDS..... KEEP THE CONTAINER TIGHTLY CLOSED WHEN NOT
IN USE.STORE AWAY FROM INCOMPATIBLE
MATERIALS.STORE IN A COOL AND
WELL-VENTILATED AREA.

SECTION 08: EXPOSURE CONTROLS/PERSONAL PROTECTION

GLOVES/ TYPE..... WEAR IMPERVIOUS GLOVES.

RESPIRATORY/TYPE..... USE NIOSH/MSHA APPROVED EQUIPMENT WHEN
AIRBORNE EXPOSURE IS EXCESSIVE.IN DUSTY
ATMOSPHERE, USE AN APPROVED DUST
RESPIRATOR.

EYE/TYPE..... GOGGLES. SAFETY GLASSES.

FOOTWEAR/TYPE..... BOOTS.

CLOTHING/TYPE..... WEAR AN APRON AND/OR AN OVERALL.

OTHER/TYPE..... EYE BATH AND SAFETY SHOWER.

ENGINEERING CONTROLS..... USE PROCESS ENCLOSURE, LOCAL EXHAUST
VENTILATION, OR OTHER ENGINEERING CONTROLS
TO MAINTAIN AIRBORNE LEVELS BELOW
RECOMMENDED EXPOSURE LIMITS.TWA = 1 MG/KG.
PROVIDE SUFFICIENT VENTILATION TO CONTROL
EXPOSURE LEVELS BELOW AIRBORNE EXPOSURE
LIMITS.

SECTION 09: PHYSICAL AND CHEMICAL PROPERTIES

SECTION 10: STABILITY AND REACTIVITY

Page 5 of 7

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COPPER SULPHATE

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SECTION 11: TOXICOLOGICAL INFORMATION

EXPOSURE LIMIT OF MATERIAL..... SEE SECTION 02.
LC 50 OF MATERIAL, SPECIES &..... SEE SECTION 02.
ROUTE
LD 50 OF MATERIAL, SPECIES &..... SEE SECTION 02.
ROUTE
CARCINOGENICITY OF MATERIAL..... NONE.
REPRODUCTIVE EFFECTS..... N.AP.

MUTAGENICITY..... N.AP.
TERATOGENICITY..... N.AP.
IRRITANCY OF MATERIAL..... SEE SECTION 03.
SENSITIZING CAPABILITY OF..... MAY CAUSE SENSITIZATION TO SOME PEOPLE.
MATERIAL
SYNERGISTIC MATERIALS..... N.AV.

SECTION 12: ECOLOGICAL CONSIDERATIONS

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL..... IN ACCORDANCE WITH MUNICIPAL, PROVINCIAL
AND FEDERAL REGULATIONS.

SECTION 14: TRANSPORT INFORMATION

UN NUMBER..... NA 9109.
TDG CLASSIFICATION..... 9.2.
PACKING GROUP..... II.
SPECIAL SHIPPING INSTRUCTIONS..... N.AP.

SECTION 15: REGULATORY INFORMATION

WHMIS CLASSIFICATION..... D1B. D2B.
CPR COMPLIANCE..... THIS PRODUCT HAS BEEN CLASSIFIED IN
ACCORDANCE WITH THE HAZARD CRITERIA OF THE
CPR AND THE MSDS CONTAINS ALL THE
INFORMATION REQUIRED BY THE CPR.

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COPPER SULPHATE

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SECTION 16: OTHER INFORMATION

N.AV.=NOT AVAILABLE.....
N.AP.=NOT APPLICABLE.....
PREPARED BY..... Regulatory Affairs
DATED..... 11171999

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DIESEL FUEL

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2482868

PRODUCT NAME(S) : LIGHT DISTILLATE

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)

PRODUCT IDENTIFICATION : MSDS Number: 08529

DATE OF MSDS : 1998-05-12

CURRENCY NOTE : This MSDS was provided to CCOHS in electronic form on 2000-12-14

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Imperial Oil (Products Division)

ADDRESS : 111 St Clair Avenue West

Toronto Ontario

Canada M5W 1K3

Telephone: 416-968-4111

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : Imperial Oil (Products Division)

ADDRESS : 111 St Clair Avenue West

Toronto Ontario

Canada M5W 1K3

Telephone: 416-968-4111

*** MATERIAL SAFETY DATA ***

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DIESEL FUEL

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Date Prepared: May 12, 1998
Supersedes: May 18, 1995
MSDS Number: 08529

1. PRODUCT INFORMATION

Product Identifier: LIGHT DISTILLATE
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)

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.

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DIESEL FUEL

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TDG INFORMATION (RAIL/ROAD):

Shipping Name: FUEL OIL
Class: 3
Packing Group: III
PIN Number: UN1202

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) 968-4111

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: 1.80 cSt at 40 deg C
Vapour Density: 4
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: 4 kPa at 38 deg C
Density: 0.85 g/cc at 15 deg C
Appearance/odour: White or pale yellow liquid, petroleum odour

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DIESEL FUEL

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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:

Manufacturer recommends:
100 ppm based on composition.

Local regulated limits may vary.

DIESEL FUEL

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.

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DIESEL FUEL

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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.

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DIESEL FUEL

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7. FIRE AND EXPLOSION HAZARD

Flashpoint and method: 40 deg C PMCT ASTM D93

Autoignition: NA Flammable Limits: LEL: 0.7% UEL: 6.5%

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.

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DIESEL FUEL

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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.

Three year WHMIS review.

This MSDS has been revised in Sections 1, 3, 7 and 8.

10. PREPARATION

Date Prepared: May 12, 1998
Prepared by: Lubricants & Specialties
IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(800) 268-3183

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DIESEL FUEL

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CAUTION: " The information contained herein relates only to this product or material and may not be valid when used in combination with any other product or material or in any process. If the product is not to be used for a purpose or under conditions which are normal or reasonably foreseeable, this information cannot be relied upon as complete or applicable. For greater certainty, uses other than those described in Section 1 must be reviewed with the supplier. The information contained herein is based on the information available at the indicated date of preparation. This MSDS is for the use of Imperial Oil customers and their employees and agents only. Any further distribution of this MSDS by Imperial Oil customers is prohibited without the written consent of Imperial Oil."

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ETHYLENE GLYCOL

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* * * * *

* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2438150

PRODUCT NAME(S) : SIPEG40-UHQ
SIPEG35-UHQ
SIPEG35-HQ
SIPEG40-HQ
1, 3-Benzenedicarboxylic Acid, 5-Sulfo, 1,
3-Bis (2-Hydroxy-
Ethyl) Ester, Sodium Salt, Solution in
Ethylene Glycol
Isophthalic Acid, 5-Sulfo, Sodium Salt,
Solution in Ethylene
Glycol
EGSIP Solution
SIPEG

PRODUCT IDENTIFICATION : MSDS NUMBER: CEC01360

DATE OF MSDS : 2000-05-25

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-10-30

*** MANUFACTURER INFORMATION ***

MANUFACTURER : DuPont Canada, Inc

ADDRESS : Post Office Box 2200
Streetsville
Mississauga Ontario
Canada L5M 2H3
Telephone: 800-387-2122 (Product
Information)

EMERGENCY TELEPHONE NO. : 613-348-3616 (Transport, 24 HOURS)
613-348-3616 (Medical, 24 HOURS)

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : DuPont Canada, Inc

ADDRESS : Post Office Box 2200
Streetsville
Mississauga Ontario
Canada L5M 2H3
Telephone: 800-387-2122 (Product
Information)

EMERGENCY TELEPHONE NO. : 613-348-3616 (Transport, 24 HOURS)
613-348-3616 (Medical, 24 HOURS)

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ETHYLENE GLYCOL

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CEC01360 SIPEG Revised 25-MAY-2000 Printed 18-JUL-2000

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

Corporate MSDS Number : DU007173
Formula : (HOCH2CH2O2C)2-C6H3-SO3Na
Molecular Weight : 356.29
CAS Name : 1,3-Benzenedicarboxylic acid, 5-sulfo, 1,
3-bis(2-hydroxy- ethyl)ester,
monosodium salt, solution in 1,2-
ethanediol

Tradenames and Synonyms

SIPEG40-UHQ
 SIPEG35-UHQ
 SIPEG35-HQ
 SIPEG40-HQ
 1,3-Benzenedicarboxylic Acid, 5-Sulfo, 1,3-Bis(2-Hydroxy-Ethyl) Ester, Sodium Salt, Solution in Ethylene Glycol
 Isophthalic Acid, 5-Sulfo, Sodium Salt, Solution in Ethylene Glycol
 EGSIP Solution
 NA-SIPEG

Company Identification

MANUFACTURER/DISTRIBUTOR

DuPont Canada, Inc.
P.O. Box 2200
Streetsville
Mississauga, Ontario L5M 2H3

PHONE NUMBERS

Product Information : 1-800-387-2122
Transport Emergency : 1-613-348-3616 (24 HOURS)
Medical Emergency : 1-613-348-3616 (24 HOURS)

ETHYLENE GLYCOL

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
	24019-46-3	
1,3-Benbenedicarboxylic Acid, 5-Sulfo, 1,3-Bis(2-Hydroxyethyl)Ester, Monosodium Salt		25-40 WT%
*1,2-Ethanediol	107-21-1	60-75 WT%

CEC01360

DuPont
Material Safety Data Sheet

Page 2

(COMPOSITION/INFORMATION ON INGREDIENTS - Continued)

* Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

HAZARDS IDENTIFICATION

Potential Health Effects

Skin contact may cause skin irritation with itching, burning, redness, swelling or rash. Skin permeation may occur in amounts capable of producing the effects of systemic toxicity. There are no reports of human sensitization.

Eye contact may cause eye irritation with discomfort, tearing, or blurring of vision.

Inhalation of Ethylene Glycol may cause irritation of the nose and throat with sneezing, sore throat or runny nose. Gross overexposure may cause pulmonary edema (body fluid in the lungs) with cough, wheezing, abnormal lung sounds, possibly progressing to severe shortness of breath and bluish discoloration of the skin; symptoms may be delayed.

The estimated mean oral lethal dose of Ethylene Glycol in adult humans is 100 mL.

Inhalation or ingestion of Ethylene Glycol may cause headache, nausea. Gross overexposure may cause central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness, convulsions, altered kidney function which may be accompanied by abnormal urine volume, low back pain, discomfort or edema, kidney failure, deposits of calcium oxalate in the brain, spinal cord and kidneys, liver abnormalities, high blood pressure, irregular heart beat with a strange sensation in the chest,

ETHYLENE GLYCOL

"heart thumping", apprehension, lightheadedness, feeling of fainting, dizziness, weakness, sometimes progressing to loss of consciousness and death, congestive heart failure, retention of acid in the blood, making oxygen less available in the blood stream and leading to symptoms of increased breathing rate, nausea, vomiting, confusion and weakness which may progress to loss of consciousness; low blood sugar, low blood calcium with muscle twitching, involuntary movement of the eyes, facial paralysis. Other effects include fatality. No increases in chromosomal changes were noted in the circulating blood of exposed workers.

Individuals with preexisting diseases of the kidneys may have increased susceptibility to the toxicity of excessive exposures.

Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

FIRST AID MEASURES

First Aid

INHALATION

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse.

EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION

If swallowed, immediately give 2 glasses of water and induce vomiting. Never give anything by mouth to an unconscious person. Call a physician.

ETHYLENE GLYCOL

Notes to Physicians

Ethanol (ETOH) is antidotal and should be administered early in the treatment. Ethanol is a potent inhibitor of Ethylene Glycol metabolism because it is preferentially acted on by liver alcohol dehydrogenase, thus delaying or preventing toxic metabolites from Ethylene Glycol.

Treatment is started after residual ingested substance is removed from the stomach. Ethanol is administered orally or IV with a goal of maintaining a blood alcohol level of approximately 22 mmol/L or 1.0 mg/L.

To prepare antidote, make a solution using 100 mL of 100 proof ethyl alcohol and 1900 mL of water. Give 1.5 mL/kg or 100 mL for an average adult. This may be mixed with orange juice for oral use if necessary. More Ethanol is to be given at 2 hour intervals to achieve and maintain the desired blood alcohol levels. Treatment may be necessary for several days.

The patient should be monitored for metabolic acidosis. Use of appropriate buffering solutions, such as bicarbonate, may be indicated.

Hemodialysis may be required.

FIRE FIGHTING MEASURES

Flammable Properties

Flash Point	: 115.6 C (240.1 F)
Method	: Tag Open Cup - TOC.
Flammable limits in Air, % by Volume	
LEL	: 3.2 %
UEL	: 15.3 %
Autoignition	: 413 C (775 F)

The above data is for pure Ethylene Glycol.

Extinguishing Media

Dry Chemical, CO2.

Fire Fighting Instructions

Wear self-contained breathing apparatus (SCBA) and full protective equipment.

ETHYLENE GLYCOL

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Eliminate all sources of ignition - heat, sparks, flame, electricity, impact and friction.

Initial Containment

Dike spill. Prevent material from entering sewers, waterways, or low areas.

Spill Clean Up

Soak up with sawdust, sand, oil dry or other absorbent material.

Accidental Release Measures

The CERCLA Reportable Quantity of Ethylene Glycol is 5,000 lbs.

HANDLING AND STORAGE

Handling (Personnel)

Avoid breathing vapors or mist. Avoid contact with eyes, skin or clothing. Wash thoroughly after handling.

Storage

Keep away from heat, sparks and flames. Close container after each use.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal Protective Equipment

EYE/FACE PROTECTION

Wear safety glasses or coverall chemical splash goggles.

ETHYLENE GLYCOL

RESPIRATOR

Where there is potential for airborne exposure, wear appropriate NIOSH approved respiratory protection.

PROTECTIVE CLOTHING

Where there is potential for skin contact have available, and wear as appropriate, impervious gloves, apron, pants, and jacket.

Exposure Guidelines

Applicable Exposure Limits

1,2-Ethanediol	
PEL (OSHA)	: None Established
TLV (ACGIH)	: Ceiling: 39.4 ppm, 100 mg/m ³ , aerosol, A4
AEL * (DuPont)	: 50 ppm, 8 Hr. TWA, vapor 10 mg/m ³ , 8 Hr. TWA, particulate

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Boiling Point	: 197.6 C (387.7 F) @ 760 mm Hg (Ethylene Glycol)
Vapor Pressure	: 0.1 mm Hg @ 25 C (77 F) (Ethylene Glycol)
Vapor Density	: 2.14 (Air=1.0) (Ethylene Glycol)
Freezing Point	: -13 C (9 F) (Ethylene Glycol)
% Volatiles	: Negligible

	CEC01360	Solubility in
Water	: 100 %	
pH	: 6-8 @ 558 g/L H ₂ O	Ethylene Glycol
Odor	: Mild.	
Form	: Viscous Liquid.	
Color	: Colorless to Light Yellow.	
Specific Gravity	: 1.115 g/cm ³ @ 20 C (68 F)	(Ethylene Glycol)

ETHYLENE GLYCOL

STABILITY AND REACTIVITY

Chemical Stability

Stable at normal temperatures and storage conditions.

Incompatibility with Other Materials

None reasonably foreseeable.

Decomposition

Decomposition will not occur.

Polymerization

Polymerization can occur. (Not violent or strongly exothermic.) Extended heating at high temperatures (>200 degC).

TOXICOLOGICAL INFORMATION

Animal Data

1,2-Ethanediol:

Oral LD50:	4,000 mg/kg in female rats
Dermal LD50:	>20 mL/kg in rabbits

SIPEG did not produce genetic damage in bacterial cell cultures.

1,2-Ethanediol is a mild skin irritant and mild eye irritant, and is untested for skin sensitization in animals. Repeated exposure by ingestion caused histopathological changes of the kidneys, bone marrow, kidney effects with oxalate crystal deposition, altered hematology, decreased body weight. Long-term exposure caused kidney effects with oxalate crystal deposition, histopathological changes of the kidneys, liver, blood vessels, testes, sperm, decreased body weight. No deaths occurred in animals exposed to saturated vapors of the compound. Repeated exposure by inhalation caused histopathological changes of the liver, lungs, eye

ETHYLENE GLYCOL

irritation, clouding of the eye (corneal opacity). In animal testing this material has not caused carcinogenicity. Reproductive data on adult animals show interference with reproduction only at levels which produce other toxic effects in the adult animal. Tests have shown this material to cause developmental toxicity in animals. This material has not produced genetic damage in bacterial cultures. There are reports indicating that this material does not produce genetic damage in some animal or mammalian cell culture tests; however, there are reports in the literature that suggest positive results.

ECOLOGICAL INFORMATION

Ecotoxicological Information

Ethylene Glycol:

96 hour LC50, Fathead minnows: 49,000 mg/L

DISPOSAL CONSIDERATIONS

Waste Disposal

Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations.

TRANSPORTATION INFORMATION

Shipping Information

DOT/IMO/IATA : Not Regulated in Containers with
less than 5,000 lbs. Ethylene Glycol

If greater than 5,000 lbs. Ethylene Glycol, use:

DOT/IMO/IATA

Proper Shipping Name : Environmentally Hazardous Substance,
Liquid, N.O.S.
(Contains Ethylene Glycol)

Hazard Class : 9

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ETHYLENE GLYCOL

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UN Number : 3082
Packing Group : III
Label : Class 9
Reportable Quantity : 5,000 lbs. Ethylene Glycol

Shipping Information -- Canada

This material is Not Regulated.

REGULATORY INFORMATION

U.S. Federal Regulations

TSCA Inventory Status : Listed.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes
Chronic : Yes
Fire : No
Reactivity : No
Pressure : No

Canadian Regulations

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

Not listed on the Canadian Domestic Substances List (DSL).

OTHER INFORMATION

NFPA, NPCA-HMIS

NPCA-HMIS Rating
Health : 2
Flammability : 1
Reactivity : 0

Personal Protection rating to be supplied by user depending on use conditions.

Additional Information

This product contains polymer-grade ethylene glycol.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

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ETHYLENE GLYCOL

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Responsibility for MSDS

CHEMICALS

DuPont Canada Inc.

7070 Mississauga Rd.

Mississauga, Ontario, L5M 2H3

(905) 821-5369.

End of MSDS

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FREON 502

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2438327

PRODUCT NAME(S) : CHLORODIFLUOROMETHANE &
CHLOROPENTAFLUOROETHANE MIXTURE
"FREON" 502

PRODUCT IDENTIFICATION : MSDS NUMBER: CEF00502

DATE OF MSDS : 1999-05-20

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-10-30

*** MANUFACTURER INFORMATION ***

MANUFACTURER : DuPont Canada, Inc

ADDRESS : Post Office Box 2200
Streetsville
Mississauga Ontario
Canada L5M 2H3
Telephone: 800-387-2122 (Product
Information)

EMERGENCY TELEPHONE NO. : 613-348-3616 (Transport, 24 HOURS)
613-348-3616 (Medical, 24 HOURS)

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : DuPont Canada, Inc

ADDRESS : Post Office Box 2200
Streetsville
Mississauga Ontario

Canada L5M 2H3
Telephone: 800-387-2122 (Product
Information)

EMERGENCY TELEPHONE NO. : 613-348-3616 (Transport, 24 HOURS)
613-348-3616 (Medical, 24 HOURS)

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FREON 502

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CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

"FREON" is a registered trademark of DuPont.

Corporate MSDS Number : DU001047
Formula : CHClF₂/CClF₂CF₃
(AZEOTROPE)

Product Use

Refrigerant

Tradenames and Synonyms

CHLORODIFLUOROMETHANE & CHLOROPENTAFLUOROETHANE MIXTURE

Company Identification

MANUFACTURER/DISTRIBUTOR

DuPont Canada, Inc.
P.O. Box 2200
Streetsville
Mississauga, Ontario L5M 2H3

PHONE NUMBERS

Product Information : 1-800-387-2122
Transport Emergency : 1-613-348-3616 (24 HOURS)
Medical Emergency : 1-613-348-3616 (24 HOURS)

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
*ETHANE, CHLOROPENTAFLUORO ("FREON" 115)	76-15-3	51.2 WT%
*METHANE, CHLORODIFLUORO ("FREON" 22)	75-45-6	48.8 WT%

* Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

FREON 502

HAZARDS IDENTIFICATION

Potential Health Effects

Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness, or death. Intentional misuse or deliberate inhalation can cause death without warning. Vapor reduces oxygen available for breathing and is heavier than air. Liquid contact can cause frostbite.

HUMAN HEALTH EFFECTS:

Overexposure to the vapors by inhalation may include temporary nervous system depression with anesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness. Higher inhalation overexposures to the vapors may cause temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation. Fatality from gross overexposure may occur. Skin contact with the liquid may cause frostbite.

Individuals with preexisting diseases of the central nervous system, cardiovascular system, lungs or kidneys may have increased susceptibility to the toxicity of excessive exposures.

Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

FIRST AID MEASURES

First Aid

INHALATION

If large amounts are inhaled, immediately remove to fresh air. Keep persons calm. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT

In case of skin contact, flush with water for 15 minutes. Treat for frostbite if necessary by gently warming affected area.

FREON 502

EYE CONTACT

In case of eye contact, immediately flush eyes with plenty of water for 15 minutes. Call a physician.

INGESTION

Ingestion is not considered a potential route of exposure.

Notes to Physicians

Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution only in situations of emergency life support.

FIRE FIGHTING MEASURES

Flammable Properties

Flash Point	: Will not burn
Flammable limits in Air, % by Volume	
LEL	: Not applicable
UEL	: Not applicable
Autoignition	: 704 C (1299 F)

Fire and Explosion Hazards:

Cylinders are equipped with temperature and pressure relief devices but still may rupture under fire conditions. Decomposition may occur.

Extinguishing Media

As appropriate for combustibles in area.

Fire Fighting Instructions

Keep containers cool with water spray. Self-contained breathing apparatus (SCBA) is required if cylinders rupture or release under fire conditions.

FREON 502

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Accidental Release Measures

Ventilate area - especially low places where heavy vapors might collect. Remove open flames. Use self-contained breathing apparatus (SCBA) for large spills. Comply with Federal, State, and local regulations for reporting releases.

HANDLING AND STORAGE

Handling (Personnel)

Avoid breathing vapors. Avoid liquid contact with skin or eyes. Use with sufficient ventilation to keep employee exposure below recommended limits.

Storage

Clean, dry area. Do not heat above 52 deg C (125 deg F).

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Use with sufficient ventilation to keep employee exposure below recommended exposure limits. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low or enclosed places.

Personal Protective Equipment

Impervious gloves and chemical splash goggles should be used if contact is possible. Under normal manufacturing conditions, no respiratory protection is required when using this product. Self-contained breathing apparatus (SCBA) is required if a spill or release occurs.

FREON 502

Exposure Guidelines

Applicable Exposure Limits

ETHANE, CHLOROPENTAFLUORO

PEL (OSHA) : None Established
TLV (ACGIH) : 1,000 ppm, 6,320 mg/m³, 8 Hr. TWA
AEL * (DuPont) : None Established

METHANE, CHLORODIFLUORO

PEL (OSHA) : None Established
TLV (ACGIH) : 1,000 ppm, 3,540 mg/m³, 8 Hr. TWA, A4
AEL * (DuPont) : None Established

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Boiling Point : -45.4 C (-49.7 F)
Vapor Pressure : 169 psia at 25 deg C (77 deg F)
Vapor Density : 3.92 at 25 deg C (77 deg F) (Air= 1)
% Volatiles : 100 WT%
Evaporation Rate : >1 (CCl₄ = 1)
Solubility in Water : 0.15 WT% @ 25 C (77 F)
pH : Neutral
Odor : Slight ethereal

Form : Liquified gas
Color : Clear, colorless
Density : 1.22 g/cc at 25 deg C (77 deg F) - Liquid

STABILITY AND REACTIVITY

Chemical Stability

Material is stable. However, avoid open flames and high temperatures.

Incompatibility with Other Materials

Incompatible with alkali or alkaline earth metals- powdered

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FREON 502

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Al, Zn, Be, etc.

Polymerization

Polymerization will not occur.

Other Hazards

Decomposition : Decomposition products are hazardous.
"FREON" 502 Refrigerant can be decomposed
by high temperatures (open flames,
glowing metal surfaces, etc.) forming
hydrochloric and hydrofluoric acids, and
possibly carbonyl halides.

TOXICOLOGICAL INFORMATION

Animal Data

"FREON" 115

Inhalation 4-hour LC50: >800,000 ppm in rats
Oral ALD : >1200 mg/kg in rats

The effects of a single inhalation exposure at high concentrations include rapid respiration and inactivity. Repeated exposure at lower levels produced no signs of toxicity. Exposure to 150,000 ppm with simultaneous epinephrine challenge produced cardiac arrhythmia in dogs. The effects of repeated ingestion include mild diarrhea, salivation and increased activity.

No animal test reports are available to define carcinogenic developmental or reproductive hazards. The compound does not produce genetic damage in bacterial cell cultures but has not been tested in animals.

"FREON" 22

Inhalation 4-hour LC50: 220,000 ppm in rats

The compound is a skin irritant and a slight eye irritant, but is not a skin sensitizer in animals.

Effects from single high exposures include central nervous system depression, anesthesia, rapid breathing, lung congestion and microscopic liver changes. Cardiac sensitization occurred in dogs at 50,000 ppm or greater from the action of exogenous epinephrine.

FREON 502

No toxic effects or abnormal histopathological observations occurred in rats repeatedly exposed to concentrations ranging from 10,000 to 50,000 ppm (v/v). Long-term exposures to 50,000 ppm (v/v) of vapors produced organ weight increases and a decrease in body weight gain, but no increased mortality or adverse hematological effects.

In chronic inhalation studies, HCFC-22, at a concentration of 50,000 ppm (v/v), produced a small, but statistically significant increase of late-occurring tumors involving salivary glands in male rats, but not female rats or male or female mice. In the same studies, no increased incidence of tumors was seen in either species at concentrations of 10,000 ppm or 1000 ppm (v/v).

Long-term administration in corn oil produced no effects on body weight or mortality.

HCFC-22 was mutagenic in some strains of bacteria in bacterial cell cultures, but not mammalian cell cultures or animals. It did not cause heritable genetic damage in mammals.

A slight, but significant increase in developmental toxicity was observed at high concentrations (50,000 ppm) of HCFC-22, a concentration which also produced toxic effects in the adult animal. Based on these findings, and other negative developmental studies, HCFC-22 is not considered a unique hazard to the conceptus. Studies of the effects of HCFC-22 on male reproductive performance have been negative. Specific studies to evaluate the effect on female reproductive performance have not been conducted, however, limited information obtained from studies on developmental toxicity do not indicate adverse effects on female reproductive performance at concentrations up to 50,000 ppm.

ECOLOGICAL INFORMATION

Ecotoxicological Information

Aquatic Toxicity:

"Freon" 22

48 hour EC50 - Daphnia magna: 433 mg/L

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FREON 502

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DISPOSAL CONSIDERATIONS

Waste Disposal

Comply with Federal, State, and local regulations. Remove to a permitted waste disposal facility or reclaim by distillation.

TRANSPORTATION INFORMATION

Shipping Information

DOT/IMO
Proper Shipping Name : CHLORODIFLUOROMETHANE AND
CHLOROPENTAFLUOROETHANE MIXTURE
Hazard Class : 2.2
UN No. : 1973
DOT/IMO Label : NONFLAMMABLE GAS

Shipping Containers

Cylinders
Ton Tanks

Shipping Information -- Canada

TDG
Proper Shipping Name : CHLORODIFLUOROMETHANE and
CHLOROPENTAFLUOROETHANE Mixture
UN # : 1973
TDG Class : 2.2

REGULATORY INFORMATION

U.S. Federal Regulations

TSCA Inventory Status : Reported/Included.

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FREON 502

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TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes
Chronic : No
Fire : No
Reactivity : No
Pressure : Yes

HAZARDOUS CHEMICAL LISTS

SARA Extremely Hazardous Substance: No
CERCLA Hazardous Substance : No
SARA Toxic Chemical - See Components Section

Canadian Regulations

CEPA Status : DSL: REPORTED/INCLUDED.

WHMIS Classification:

CLASS A Compressed Gas

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

OTHER INFORMATION

NFPA, NPCA-HMIS

NPCA-HMIS Rating
Health : 1
Flammability : 0
Reactivity : 1

Personal Protection rating to be supplied by user depending on use conditions.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS : FLUOROPRODUCTS
Address : DuPont Canada Inc.
Box 2200, Streetsville,
Mississauga, Ontario, L5M 2H3

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FREON 502

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Telephone : (905)821-5935

Indicates updated section.

End of MSDS

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FREON

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 1185887

PRODUCT NAME(S) : Freon 12, R 12

PRODUCT IDENTIFICATION : CAS No.: 75-71-8

Form No. F-85312-4

DATE OF MSDS : 1995-05-19

*** MANUFACTURER INFORMATION ***

MANUFACTURER : ANSUL INCORPORATED

ADDRESS : One Stanton Street

Marinette Wisconsin

U.S.A. 54143-2542

Telephone: 715-735-7411 (Other

Information Calls)

EMERGENCY TELEPHONE NO. : 800-424-9300 (CHEMTREC)

FREON 12, R 12

QUICK IDENTIFIER (In Plant Common Name)

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Prepared By: Safety and Health Department

Date Prepared: May 19, 1995

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SECTION 1 - IDENTITY

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Common Name: (used on label) Freon 12, R 12

(Trade Name and Synonyms)

CAS No.: 75-71-8

Chemical Dichlorodifluoromethane Chemical Halogenated Methane

Name: Family:

Formula: CCl₂F₂

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FREON

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SECTION 2 - INGREDIENTS

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PART A - HAZARDOUS INGREDIENTS

Principal Hazardous Component(s) (chemical and common name(s)):	Wt. %	CAS No.
Dichlorodifluoromethane		75-71-8
ACGIH TLV: 1,000 ppm		
Acute Toxicity Data: LC50(rat) 800,000 ppm/30 min.		

PART B - OTHER INGREDIENTS

Other Component(s) (chemical and common name(s)):	Wt. %	CAS No.
None		N/A
Acute Toxicity Data: N/A		

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SECTION 3 - PHYSICAL AND CHEMICAL CHARACTERISTICS

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(Fire and Explosion Data)

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Boiling Point: -21.6 deg F
Specific Gravity (H2O=1): 1.33
Vapor Pressure (mm Hg): 70.1 psi @ 70 deg F
Percent Volatile by Volume (%): 100
Vapor Density (Air = 1): 4.3
Evaporation Rate (= 1): N/A Gas at room temperature
Solubility in Water: Negligible
Reactivity in Water: Unreactive
Appearance and Odor: Colorless gas, sweet odor.

Flash Point: None

Flammable Limits in Air % by Volume: N/A

Extinguisher Media: N/A

Auto-Ignition Temperature: N/A

Special Fire Fighting Procedures: Use water to cool fire-exposed cylinders or other containers. Self-contained breathing apparatus with full facepiece and protective clothing when re-entering unventilated fire areas where product has been used.

Unusual Fire and Explosion Hazards: Containers are equipped with pressure and temperature relief devices, but rupture may occur under fire conditions and toxic decomposition by-products may be formed if used in fires over 900 deg F.

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FREON

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SECTION 4 - PHYSICAL HAZARDS

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Stability: Unstable [] Conditions Can be decomposed under fire
 Stable [X] to Avoid: conditions above 900 deg F.

Incompatibility Active metals and fires involving metal hydrides.
(Materials to Avoid):

Hazardous Thermal decomposition at temperatures above 900 deg F
Decomposition Products: forming hydrochloric and hydrofluoric acids. These
 by-products have a sharp irritating odor. They are
 dangerous even in low concentrations, and in
 sufficient concentrations can result in personal
 injury or death.

Hazardous May Occur [] Conditions N/A

Polymerization: Will Not Occur [X] to Avoid:

NOTE: As used in Ansul extinguishers or cylinders, Freon 12 is a gas
compressed under pressure up to 360 psi at 70 deg F.

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SECTION 5 - HEALTH HAZARDS

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Threshold 1000 ppm is the OSHA PEL and the ACGIH TLV. NOTE: The
Limit Value: effects of exposure to Freon 12 should disappear quickly
 upon removal from exposure. LC50 rats greater than
 800,000 ppm/30 min.

Routes of Entry:

Eye Contact: The liquid form of this material can produce chilling
 sensations and discomfort, also frostbite.

Skin Contact: Evaporation of liquid from the skin can produce chilling
 sensations. Frostbite can occur.

Inhalation: Vapor is heavier than air and can cause suffocation by
 reducing oxygen available for breathing. Breathing very
 high concentrations of vapor can cause lightheadedness,
 giddiness, shortness of breath, and may lead to narcosis,
 cardiac irregularities, unconsciousness or even death.
 LC50 rats, 800,000 ppm/30 min.

Ingestion: Ingestion is not likely to occur since this material is
 gas at room temperature.

Signs and Symptoms:

Acute Overexposure: Dizziness, impaired coordination, reduced mental
 acuity, and cardiac effects can occur.
 Unconsciousness or even death in high concentrations
 with longer exposures.

Chronic Overexposure: None known when occupational exposures are below the
 TLV.

Medical Conditions Generally: Cardiac problems.

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FREON

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Aggravated by Exposure:

Chemical Listed as Carcinogen or Potential:

National Toxicology	Yes []	I.A.R.C.	Yes []	OSHA:	Yes []
Program:	No [X]	Monographs:	No [X]		No [X]

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SECTION 6 - EMERGENCY AND FIRST AID PROCEDURES

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Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes while holding lids open. If redness, itching or a burning sensation develops, get Medical attention. Treat for frostbite if necessary.

Skin Contact: Wash the material off the skin with copious amounts of soap and water for at least 15 minutes. If redness, itching, or burning occurs, get Medical attention. Treat for frostbite if necessary.

Inhalation: Remove victim to fresh air. If cough or other respiratory symptoms occur, consult Medical personnel. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Consult Medical personnel.

Ingestion: If patient is conscious, give 1 to 2 glasses of warm water to drink and get Medical attention. DO NOT INDUCE VOMITING. Have victim lie down and keep warm.

NOTE TO PHYSICIAN: Product is an asphxiant and can induce cardiac muscle sensitization to circulating epinephrine-like compounds. Do NOT give adrenalin or similar sympathomimetic drugs. Do NOT allow victim to exercise until 24 hours following specific exposures. Freeze burns of mucosal tissue can develop following specific exposures.

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SECTION 7 - SPECIAL PROTECTION INFORMATION

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Respiratory Protection (Specify Type): Not normally necessary if controls are adequate. Self-contained breathing apparatus must be worn when using this product in testing Halon suppression systems.

Ventilation: Local Exhaust: Recommended to control exposures. See mechanical.

Mechanical (General): Recommended in low areas or indoors where vapors may collect.

Protective Gloves: Lined butyl gloves for handling liquid.

Eye Protection: Chemical goggles recommended. Full faceshield in addition if splashing of liquid form

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FREON

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is possible.

Other Protective Eye wash and safety showers are good safety practice
Clothing or Equipment: in work areas when working with liquefied product.

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SECTION 8 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

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Precautions to be Taken in Handling and Storage:	Store as a liquefied compressed gas in DOT approved pressure vessels away from high temperatures. If cylinder is not attached to a system, it must be safety capped to protect against actuation of valve and release of agent.
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Other Precautions:	Note incompatibility information in Section 4.
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Steps to be Taken in Case Material is Released or Spilled:	Evacuate area; ventilate to outside atmosphere. Cool or remove hot, metal surfaces or source of non-extinguished flames.
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Waste Disposal Methods:	EPA Hazardous Waste No. UO 75. Dispose of in compliance with local, state, and federal regulations.
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HAZARDOUS MATERIAL IDENTIFICATION SYSTEM RATINGS

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HAZARD INDEX:

4 Severe Hazard	1 HEALTH
3 Serious Hazard	0 FLAMMABILITY
2 Moderate Hazard	0 REACTIVITY
1 Slight Hazard	
0 Minimal Hazard	

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N/A = Not Applicable NDA = No Data Available

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Form No. F-85312-4

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GASOLINE (GENERIC)

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* * * * *

* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2461632

PRODUCT NAME(S) : GASOLINE (GENERIC)

PRODUCT IDENTIFICATION : MSDS Number: 002914

DATE OF MSDS : 2000-07-22

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-10-03

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Chevron Products Company

ADDRESS : 6001 Bollinger Canyon Road
San Ramon California
U.S.A. 94583
Telephone: 800-689-3998 (Product
Information, MSDS Requests) 510-242-5357
(Product Information, Technical Information)

EMERGENCY TELEPHONE NO. : 800-231-0623 (Health, 24 hr)
510-231-0623 (International, Health, 24
hr)
800-424-9300 (CHEMTREC, Transportation,
24 hr)
703-527-3887 (Transportation 24hr,
Emergency Info Centers are in USA, Int'l
collect calls accepted)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

GASOLINE (GENERIC)

COMPANY IDENTIFICATION

Chevron Products Company
Marketing, MSDS Coordinator
6001 Bollinger Canyon Road
San Ramon, CA 94583

EMERGENCY TELEPHONE NUMBERS

HEALTH (24 hr): (800)231-0623 or
(510)231-0623 (International)
TRANSPORTATION (24 hr): CHEMTREC
(800)424-9300 or (703)527-3887
Emergency Information Centers
are located in U.S.A.
Int'l collect calls accepted

PRODUCT INFORMATION: (800)689-3998 MSDS Requests and Product Information

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GASOLINE (GENERIC)

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2. COMPOSITION/INFORMATION ON INGREDIENTS

100.0 % GASOLINE (GENERIC)

CONTAINING

COMPONENTS	AMOUNT	LIMIT/QTY	AGENCY/TYPE
GASOLINE (GENERIC)	100.00%	890 mg/m3 1480 mg/m3 2000 mg/m3	ACGIH TWA ACGIH STEL OSHA PEL

POTENTIALLY

INCLUDING

BENZENE

Chemical Name: BENZENE

CAS71432

< 5.00%

0.5 ppm

ACGIH TWA

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2.5 ppm	ACGIH STEL
1 ppm	OSHA PEL
5 ppm	OSHA CEILING
10 LBS	CERCLA 302.4 RQ

ETHYL BENZENE

Chemical Name: BENZENE, ETHYL-

CAS100414

100 ppm	ACGIH TWA
125 ppm	ACGIH STEL
100 ppm	OSHA PEL
1,000 LBS	CERCLA 302.4 RQ

XYLENE

Chemical Name: BENZENE, DIMETHYL-

CAS1330207

100 ppm	ACGIH TWA
150 ppm	ACGIH STEL
100 ppm	OSHA PEL
100 LBS	CERCLA 302.4 RQ

TOLUENE

Chemical Name: TOLUENE

CAS108883

50 ppm	ACGIH TWA
200 ppm	OSHA PEL

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	300 ppm	OSHA CEILING
	1,000 LBS	CERCLA 302.4 RQ
N-BUTANE		
Chemical Name: N-BUTANE		
CAS106978	800 ppm	ACGIH TWA
N-HEPTANE		
Chemical Name: N-HEPTANE		
CAS142825	400 ppm	ACGIH TWA
	500 ppm	ACGIH STEL
	500 ppm	OSHA PEL
N-HEXANE		
Chemical Name: N-HEXANE		
CAS110543	50 ppm	ACGIH TWA
	500 ppm	OSHA PEL
	5,000 LBS	CERCLA 302.4 RQ
HEXANE ISOMERS (OTHER THAN N)		
HEXANES		
	500 ppm	ACGIH TWA
	1000 ppm	ACGIH STEL
PENTANE (ALL ISOMERS)		
PENTANES		
	600 ppm	ACGIH TWA
	750 ppm	ACGIH STEL
	1000 ppm	OSHA PEL
CYCLOHEXANE		
Chemical Name: CYCLOHEXANE		
CAS110827	300 ppm	ACGIH TWA
	300 ppm	OSHA PEL
	1,000 LBS	CERCLA 302.4 RQ
METHYLCYCLOHEXANE		
Chemical Name: CYCLOHEXANE, METHYL		
CAS108872	400 ppm	ACGIH TWA
	500 ppm	OSHA PEL
TRIMETHYLBENZENE		
Chemical Name: BENZENE, TRIMETHYL-		
CAS25551137	25 ppm	ACGIH TWA
2,2,4-TRIMETHYLPENTANE		
Chemical Name: 2,2,4-TRIMETHYLPENTANE		
CAS540841	1,000 LBS	CERCLA 302.4 RQ

CAN CONTAIN

METHYL TERT BUTYL ETHER (MTBE)
Chemical Name: 2-METHOXY-2-METHYL PROPANE

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CAS1634044	< 15.00%	40 ppm	ACGIH TWA
		50 ppm	Chevron STEL
		1,000 LBS	CERCLA 302.4 RQ

ETHYL TERT BUTYL ETHER (ETBE)

Chemical Name: 2-ETHOXY-2-METHYL PROPANE

CAS637923	< 18.00%	NONE	NA
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TERT-AMYL METHYL ETHER (TAME)

Chemical Name: 2-METHOXY-2-METHYL-BUTANE

CAS994058	< 17.00%	50 ppm	Chevron STEL
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OR

ETHANOL

Chemical Name: ETHYL ALCOHOL

CAS64175	< 10.00%	1000 ppm	ACGIH TWA
		1000 ppm	OSHA PEL

COMPOSITION COMMENT:

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.

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. Ethyl Alcohol is only added in limited specific distribution areas.

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3. HAZARDS IDENTIFICATION

***** EMERGENCY OVERVIEW *****

Variable colored liquid with a petroleum hydrocarbon odor.

- EXTREMELY FLAMMABLE
- HARMFUL OR FATAL IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE
- VAPOR HARMFUL

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GASOLINE (GENERIC)

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- MAY CAUSE EYE AND SKIN IRRITATION
- LONG-TERM EXPOSURE TO VAPOR HAS CAUSED CANCER IN
LABORATORY ANIMALS
- KEEP OUT OF REACH OF CHILDREN

IMMEDIATE HEALTH EFFECTS

EYE:

Contact with the eyes causes irritation. Eye contact with the vapors, fumes, or spray mist from this substance could also cause similar signs and symptoms.

SKIN:

Contact with the skin causes irritation. Not expected to be harmful to internal organs if absorbed through the skin. Prolonged or frequently repeated contact may cause the skin to become cracked or dry from the defatting action of this material.

INGESTION:

Because of the low viscosity of this substance, it can directly enter the lungs if it is swallowed (this is called aspiration). This can occur during the act of swallowing or when vomiting the substance. Once in the lungs, the substance is very difficult to remove and can cause severe injury to the lungs and death.

INHALATION:

May be harmful if inhaled. Breathing the vapors at concentrations above the recommended exposure standard can cause central nervous system effects. The vapor or fumes from this material may cause respiratory irritation.

SIGNS AND SYMPTOMS OF EXPOSURE:

Eye damage or irritation: may include pain, tearing, reddening, swelling, and impaired vision. Skin injury: may include pain, discoloration, swelling, and blistering. Respiratory irritation: may include coughing and difficulty breathing. 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.

CARCINOGENICITY:

Risk depends on duration and level of exposure. See Section 11 for additional information. Gasoline has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC). Contains chemical(s) known to the State of California to cause cancer. 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

GASOLINE (GENERIC)

Cancer (IARC).

Whole gasoline exhaust was reviewed by the International Agency for Research on Cancer (IARC) in their Monograph Volume 46 (1989). Evidence for causing cancer was considered inadequate in animals and inadequate in humans. IARC placed whole gasoline exhaust in Category 2B, considering it possibly carcinogenic to humans.

4. FIRST AID MEASURES

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 immediately with soap and water and remove contaminated clothing and shoes. Get medical attention if irritation persists. Discard contaminated clothing and shoes or thoroughly clean before reuse.

INGESTION:

If swallowed, give water or milk to drink and telephone for medical advice. DO NOT make person vomit unless directed to do so by medical personnel. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital.

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 can result in aspiration of light hydrocarbon liquid which can cause pneumonitis.

5. FIRE FIGHTING MEASURES

FIRE CLASSIFICATION:

OSHA Classification (29 CFR 1910.1200): Flammable liquid. See section 7 for appropriate handling and storage conditions.

FLAMMABLE PROPERTIES:

FLASH POINT: (TCC) < -49F (<-45C)

AUTOIGNITION: 536F (280C)

FLAMMABILITY LIMITS (% by volume in air): Lower: 1.4 Upper: 7.6

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EXTINGUISHING MEDIA:

CO2, Dry Chemical, Fire Fighting Foam, AFFF.

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

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:

Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.

6. ACCIDENTAL RELEASE MEASURES

CHEMTREC EMERGENCY NUMBER (24 hr): (800)424-9300 or (703)527-3887

International Collect Calls Accepted

ACCIDENTAL RELEASE MEASURES:

Eliminate all sources of ignition in the vicinity of the spill or released vapor. Stop the source of the leak or release. Clean up releases as soon as possible, observing precautions in Exposure Controls/Personal Protection. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

Release of this product should be prevented from contaminating soil and water and from entering drainage and sewer systems. U.S.A. regulations require reporting spills of this material that could reach any surface waters. The toll free number for the U.S. Coast Guard National Response Center is (800) 424-8802.

7. HANDLING AND STORAGE

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,

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welding equipment, and electrical motors and switches.

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.

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 USE OR STORE near heat, sparks or open flames. USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use. READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.

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 properly disposed of.

Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe vapor or fumes. Do not breathe mist. Wash thoroughly after handling.

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

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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. Suggested materials for protective gloves include: <Nitrile> <Polyurethane> <Viton> <Chlorinated Polyethylene (or Chlorosulfonated Polyethylene or CPE)>

RESPIRATORY PROTECTION:

Determine if airborne concentrations are below the recommended exposure limits. If not, wear a NIOSH approved respirator that provides adequate protection from measured concentrations of this material. Use the following respirators: Organic Vapor. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DESCRIPTION:

Variable colored liquid with a petroleum hydrocarbon odor.

pH:	NA
VAPOR PRESSURE:	5 - 15 PSI @ 100F (REID)
VAPOR DENSITY	
(AIR=1):	3-4
BOILING POINT:	25 - 225C (range)
FREEZING POINT:	NA
MELTING POINT:	NA
SOLUBILITY:	Soluble in hydrocarbons; insoluble in water.
SPECIFIC GRAVITY:	0.7 - 0.8 @ 15.6/15.6C
PERCENT VOLATILE (VOL):	99+%

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GASOLINE (GENERIC)

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10. STABILITY AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:

None known

CHEMICAL STABILITY:

Stable.

CONDITIONS TO AVOID:

See section 7.

INCOMPATIBILITY WITH OTHER MATERIALS:

May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

HAZARDOUS POLYMERIZATION:

Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS:

The mean 24-hour Draize eye irritation score in rabbits is 0.

SKIN EFFECTS:

This material was not a skin sensitizer in the modified Buehler Guinea Pig Sensitization Test. For a 4-hour exposure, the Primary Irritation Index (PII) in rabbits is: 4.8.

ACUTE ORAL EFFECTS:

The oral LD50 in rats is > 5 ml/kg.

ACUTE INHALATION EFFECTS:

No product toxicology data available.

ADDITIONAL TOXICOLOGY INFORMATION:

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 and liquid is potentially high, attention should be paid to potential toxic effects of specific components in addition to those of total hydrocarbons. Information about specific components in gasoline are found in Section 1 and Section 15 of this MSDS. More detailed information on the health hazard of specific gasoline components can be obtain from the Chevron Emergency Information Center (see Section 1 for telephone numbers).

A study was done in which ten volunteers were exposed for 30 minutes to about 200, 500 or 1000 ppm concentrations of the vapor of three different

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unleaded gasolines. Irritation of the eyes was the only significant effect observed, based on both subjective and objective assessments.

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 (sex ratio, embryotoxicity, fetal growth and development).

An inhalation study with pregnant rats exposed to 0, 1000, 3000, and 9000 ppm of unleaded gasoline vapor, 6 hours per day on days 6 through 20 of gestation, showed no teratogenic effects nor indications of toxicity to either the mother or the fetus.

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 day 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 changes in the nervous system.

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.

Rabbits were exposed to unleaded gasoline 24 hour per day, 5 days per week for two weeks; 0, 2.5, 5 or 8 ml were applied to the skin under an occlusive dressing. Applied in such a way, this motor gasoline was corrosive to the rabbit skin and animals in all dose groups had decreased bodyweights. The slight and/or isolated systemic effects noted in the study were judged to be not significant.

Unleaded gasoline was assayed for mutagenic and cytogenetic activity. Gasoline was not mutagenic, either with or without activation, in Ames assay (*Salmonella typhimurium*), *Saccharomyces cerevisiae*, or mouse lymphoma assays. In addition, point mutations were not induced in human lymphocytes exposed to gasoline in vivo. The 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.

In a lifetime skin painting study, 50 male Swiss mice were treated with 0.05 ml of unleaded gasoline three times per week. Positive control groups were treated with benzo(a)pyrene in acetone; an untreated negative

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GASOLINE (GENERIC)

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control group was also included. The repeated exposure to gasoline caused severe skin irritation, ulceration, hyperkeratosis and abscesses. There was no statistically significant increase in the incidence of skin tumors. Histopathology at the end of the study showed that unleaded gasoline did not increase the incidence of tumors in other organs.

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 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 the mechanism by which wholly vaporized unleaded gasoline causes kidney damage is unique to the male rat. The response 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.

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, a nested case-control, and an exposure assessment study. Histories of exposure to gasoline were reconstructed for a cohort of more than 18,000 employees from four companies for the time period between 1946 and 1985. Data were analyzed based on length of employment, length of exposure, job category, age at first exposure and estimated cumulative and peak exposures. Cumulative exposure was defined as the sum of products of TWA exposure and duration of exposure of each job in an employee's work history. Among cohort members, cumulative exposure ranged from 2 to 8,000 ppm-years. In general, long-term drivers at small terminals had the highest exposures, and short-term workers with "other terminal jobs" had the lowest. A peak exposure was defined as an episode in excess of 500 ppm lasting 15 to 90 minutes.

The results of the cohort 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.

For acute myeloid leukemia (AML), a non-significant mortality increase was

GASOLINE (GENERIC)

found in land-based terminal employees, but no trend was detected when the data were analyzed by various gasoline exposure indices. This non-significant excess was limited to land-based terminal employees hired prior to 1948. On the other hand, a deficit of mortality from AML was observed among marine employees.

In addition to the cohort study, a subsequent nested case-control study was also conducted. Four diseases were selected for analysis in the case-control study: Leukemia (all cell types), AML, kidney cancer and multiple myeloma. For each case, five individually matched controls were randomly selected from the cohort. In the original cohort study, broad generic job categories were used as part of exposure assessment. In the case-control study, a finer and more homogeneous job classification was developed. In addition to job category, several quantitative gasoline exposure indices were used in the case-control analysis: length of exposure, cumulative exposure (ppm-years in terms of total hydrocarbons) and frequency of peak exposure. Time period of first exposure to gasoline (1948 or before and 1949 or after) was also included as an exposure index. 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.

12. ECOLOGICAL INFORMATION

ECOTOXICITY:

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.

The 96-hour LC50 in rainbow trout (*Oncorhynchus mykiss*) is 2.7 mg/l (BTEX). The 48-hour LC50 in daphnia (*Daphnia magna*) is 3.0 mg/l (BTEX). The 96-hour LC50 in sheepshead minnow (*Cyprinodon variegatus*) is 8.3 mg/l

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GASOLINE (GENERIC)

(BTEX). The 96-hour LC50 in mysid shrimp (*Mysidopsis bahia*) is 1.8 mg/l (BTEX).

ENVIRONMENTAL FATE:

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+xylenes and naphthalene, is reported to be 112 mg/l. Solubility data on individual gasoline constituents also available.

13. DISPOSAL CONSIDERATIONS

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 USEPA under RCRA (40CFR261) 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.

14. TRANSPORT INFORMATION

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
DOT HAZARD CLASS: 3 (FLAMMABLE LIQUID)
DOT IDENTIFICATION NUMBER: UN1203
DOT PACKING GROUP: II

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GASOLINE (GENERIC)

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15. REGULATORY INFORMATION

SARA 311 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:

01=SARA 313	11=NJ RTK	22=TSCA Sect 5(a)(2)
02=MASS RTK	12=CERCLA 302.4	23=TSCA Sect 6
03=NTP Carcinogen	13=MN RTK	24=TSCA Sect 12(b)
04=CA Prop 65-Carcin	14=ACGIH TWA	25=TSCA Sect 8(a)
05=CA Prop 65-Repro Tox	15=ACGIH STEL	26=TSCA Sect 8(d)
06=IARC Group 1	16=ACGIH Calc TLV	27=TSCA Sect 4(a)
07=IARC Group 2A	17=OSHA PEL	28=Canadian WHMIS
08=IARC Group 2B	18=DOT Marine Pollutant	29=OSHA CEILING
09=SARA 302/304	19=Chevron TWA	30=Chevron STEL
10=PA RTK	20=EPA Carcinogen	

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

BENZENE, ETHYL-

is found on lists: 01,02,08,10,11,12,13,14,15,17,26,28,

N-BUTANE

is found on lists: 02,10,11,13,14,28,

CYCLOHEXANE, METHYL

is found on lists: 02,10,11,13,14,17,26,28,

TOLUENE

is found on lists: 01,02,05,10,11,12,13,14,17,26,28,29,

N-HEXANE

is found on lists: 01,02,10,11,12,13,14,17,27,28,

CYCLOHEXANE

is found on lists: 01,02,10,11,12,13,14,17,26,28,

BENZENE, DIMETHYL-

is found on lists: 01,02,10,11,12,13,14,15,17,

N-HEPTANE

is found on lists: 02,10,11,13,14,15,17,26,28,

2-METHOXY-2-METHYL PROPANE

is found on lists: 01,02,10,11,12,14,24,26,27,30,

BENZENE, TRIMETHYL-

is found on lists: 02,10,11,13,14,26,28,

2,2,4-TRIMETHYLPENTANE

is found on lists: 02,10,11,12,26,

2-ETHOXY-2-METHYL PROPANE

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GASOLINE (GENERIC)

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is found on lists: 25,26,
ETHYL ALCOHOL
is found on lists: 02,10,11,13,14,17,28,
BENZENE
is found on lists: 01,02,03,04,06,10,11,12,13,14,15,17,20,28,29,
2-METHOXY-2-METHYL-BUTANE
is found on lists: 24,25,26,27,30,
GASOLINE (GENERIC)
is found on lists: 04,08,14,15,17,
PENTANES
is found on lists: 14,15,17,
HEXANES
is found on lists: 14,15,

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

16. OTHER INFORMATION

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).

REVISION STATEMENT:

This revision updates Sections 1, 3, 5, 7, 9, 15, & 16.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	TPQ - Threshold Planning Quantity
RQ - Reportable Quantity	PEL - Permissible Exposure Limit
C - Ceiling Limit	CAS - Chemical Abstract Service Number
A1-5 - Appendix A Categories	() - Change Has Been Proposed
NDA - No Data Available	NA - Not Applicable

Prepared according to the OSHA Hazard Communication Standard
(29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Toxicology
and Health Risk Assessment Unit, CRTC, P.O. Box 1627, Richmond, CA 94804

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GASOLINE (GENERIC)

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The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

THIS IS THE LAST PAGE OF THIS MSDS

Revision Number: 14 Revision Date: 07/22/00 MSDS Number: 002914

Revision Number: 14 Revision Date: 07/22/00 MSDS Number: 002914

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GREASE

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 287372

PRODUCT NAME(S) : Inland 16350 High Vacuum Grease
(Perfluorinated polyether thickened with
fluorotelomer)

DATE OF MSDS : 1986-12-19

CURRENCY NOTE : MSDS Confirmed Current: 1997-05-13

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Inland Vacuum Industries

ADDRESS : 35 Howard Avenue
Churchville New York
U.S.A. 14428

EMERGENCY TELEPHONE NO. : 716-293-3330 (Days)
803-548-2346 (Evenings)

*** MATERIAL SAFETY DATA ***

IDENTITY Inland 16350 High Vacuum Grease (Perfluorinated polyether thickened
with fluorotelomer)

SECTION I

PREPARATION DATE 12-19-86

PREPARER'S SIGNATURE

SECTION II HAZARDOUS INGREDIENTS AND IDENTITY INFORMATION

HAZARDOUS COMPONENT	OSHA PEL	ACGIH TLV	OTHER LIMITS	%(OPT)
Fluorine end-capped homopolymers of hexafluoropropylene epoxide thickened with fluorotelomers				100

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GREASE

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SECTION III PHYSICAL AND CHEMICAL CHARACTERISTICS

BOILING POINT (deg C)	>200
SPECIFIC GRAVITY (H2O=1)	>1.90
VAPOR PRESSURE (Torr)	<.0001
MELTING POINT (deg C) (pour point)	-45 to -5
VAPOR DENSITY (AIR=1)	~70
EVAPORATION RATE	
(BUTYL ACETATE=1)	Nil
SOLUBILITY IN WATER	Nil
APPEARANCE AND ODOR	white dense, viscous fluid

SECTION VI FIRE AND EXPLOSION DATA

FLASH POINT (METHOD USE) None (Pensky-Martens Closed Cup)

FLAMMABLE LIMITS Not applicable LEL UEL

EXTINGUISHING MEDIA As appropriate for other combustibles in the area

SPECIAL FIRE FIGHTING PROCEDURES Wear breathing gear when fighting fires in enclosed areas because decomposition of Krytox at flame temperatures may form toxic fluorine compounds.

UNUSUAL FIRE AND EXPLOSION HAZARDS None

SECTION V REACTIVITY DATA

STABLE (Y/N) [Y] CONDITIONS TO AVOID

HAZARDOUS POLYMERIZATION (Y/N) [N] CONDITIONS TO AVOID

INCOMPATIBILITY No Incompatibilities are reasonably foreseen

HAZARDOUS DECOMPOSITION PRODUCTS See Health Hazard Information

SECTION VI HEALTH HAZARD DATA

ROUTES OF ENTRY: INHALATION: Not normally

 SKIN: Yes

 INGESTION: Not normally

HEALTH HAZARDS (ACUTE AND CHRONIC) Acute: May cause mild eye irritation and mild skin irritation. Inhalation of smoke from tobacco contaminated with this compound may cause throat irritation, cough and tightness in chest.

The known physiological effects of the separate ingredients of these materials indicate a very low order of toxicity in animals by skin contact (ALD >17000 mg/kg rabbits); by ingestion (ALD >25000mg/kg rats); and at-room-temperature inhalation (4 hr ALC 19.54 mg/l rats). Decomposition products formed at temperatures above 260 C are irritating to the lungs of animals. Pulmonary edema and death occurred in rats exposed to decomposition products may include lung irritation. Inhalation of decomposition products formed at ~290 C may required treatment of lung irritation for fluorine compounds which can cause

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GREASE

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delayed pulmonary edema. Prolonged skin contact may cause redness and inflammation of hair follicles without sensitization.

CARCINOGENICITY NTP IARC MONOGRAPHS OSHA REGULATED
None of the components of this chemical is listed by IARC, NTP, or OSHA as a carcinogen.

SYMPTOMS OF EXPOSURE See above

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE Unknown

EMERGENCY FIRST AID PROCEDURES Inhalation - if inhaled remove to fresh air. If not breathing, give artificial respiration and call a physician. Skin contact - flush skin with water after prolonged or repeated contact. Eye contact - immediately flush eyes with plenty of water for at least 15 minutes. Call a physician. Ingestion - do not induce vomiting. Immediately give two glasses of water or activated charcoal slurry. Never give anything by mouth to an unconscious person.

SECTION VII PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Soak up spill with sawdust sand, oil-dry or other absorbent material. Remove sources of heat and flame. At 260-290 C material forms potentially toxic fluorine compounds. Avoid breathing any decomposition products. Place in container for disposal. Review other areas of this sheet for additional information.

WASTE DISPOSAL METHOD Dispose of in accordance with appropriate Federal, State and Local regulations. Do not flush liquid to surface water or sanitary sewer system.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING No special precautions..not regulated by DOT

OTHER PRECAUTIONS

SECTION VIII CONTROL MEASURES

RESPIRATORY PROTECTION (TYPE) should not be required when working with material under normal conditions

VENTILATION	LOCAL	SPECIAL
	MECHANICAL	OTHER

PROTECTIVE GLOVES Impermeable rubber gloves

EYE PROTECTION Goggles or safety glasses with side shields

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GREASE

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OTHER PROTECTIVE EQUIPMENT n.a.

WORK/HYGENIC PRACTICES Keep containers tightly closed. Do not consume food or tobacco in areas where they could become contaminated with this material. Provide adequate ventilation. Keep material from heat and flame.

ISN: 287372

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HALON

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 950167

PRODUCT NAME(S) : HALON 1211, BCF

PRODUCT IDENTIFICATION : Form No. F-85320-7

DATE OF MSDS : 1995-03-08

*** MANUFACTURER INFORMATION ***

MANUFACTURER : ANSUL INCORPORATED

ADDRESS : One Stanton Street

Marinette Wisconsin

U.S.A. 54143-2542

Telephone: 715-735-7411 (Other

Information Calls)

EMERGENCY TELEPHONE NO. : 800-424-9300 (CHEMTREC)

HALON 1211

QUICK IDENTIFIER (In Plant Common Name)

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Prepared By: Safety and Health Department

Date Prepared: March 8, 1995

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SECTION 1 - IDENTITY

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Common Name: (used on label) Halon 1211, BCF

(Trade Name and Synonyms)

CAS No.: N/A

Chemical Name: Bromochlorodifluoromethane

Chemical Family: Halogenated Hydrocarbon

Formula: CF2ClBR

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SECTION 2 - INGREDIENTS

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PART A - HAZARDOUS INGREDIENTS

Principal Hazardous Component(s) (chemical and common name(s)):	%	CAS No.
Bromochlorodifluoromethane	Greater than 99	353-59-3
Chemical Listed Under SARA Title		

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HALON

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III - Section 311

ACGIH TLV: Not listed
Acute Toxicity Data:
ihl rat LCLO 32 pph/15 M

WARNING:

Bromochlorodifluoromethane is a substance which harms public health and environment by destroying ozone in the upper atmosphere.

PART B - OTHER INGREDIENTS

Other Component(s) (chemical and common name(s)):	%	CAS No.
None	N/A	N/A

Acute Toxicity Data: N/A

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SECTION 3 - PHYSICAL AND CHEMICAL CHARACTERISTICS

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(Fire and Explosion Data)

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Boiling Point: 26 deg F
Specific Gravity (H2O=1): 1.83
Vapor Pressure (mm Hg): 37.5 psi @ 70 deg F

Percent Volatile by Volume (%): 100
Vapor Density (Air = 1): 5.7
Evaporation Rate (Butyl acetate = 1): Gas at room temperature
Solubility in Water: Negligible
Reactivity in Water: Unreactive
Appearance and Odor: Colorless gas, sweet odor.

Flash Point: None to boiling
Flammable Limits in Air % by Volume: N/A
Extinguisher Media: N/A
Auto-Ignition Temperature: N/A

Special Fire Fighting Procedures: THIS IS A FIRE EXTINGUISHING AGENT. Use water to cool fire-exposed cylinders or other containers. Self-contained breathing apparatus with full facepiece and protective clothing when re-entering unventilated fire areas where product has been used.

Unusual Fire and Explosion Hazards: Containers are equipped with pressure and temperature relief devices, but rupture may occur under fire conditions and toxic decomposition by-products may be formed if used in fires over 900 deg F.

SECTION 4 - PHYSICAL HAZARDS

SECTION 5 - HEALTH HAZARDS

HALON				
Program:	No [x]	Monographs:	No [x]	No [x]

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NOTE TO PHYSICIAN: Product is an asphxiant and can induce cardiac muscle sensitization to circulating epinephrine-like compounds. Do NOT give adrenalin or similar sympathomimetic drugs. Do NOT allow victim to exercise until 24 hours following specific exposures. Freeze burns of mucosal tissue can develop following specific exposures.

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SECTION 7 - SPECIAL PROTECTION INFORMATION

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Ventilation:	Local Exhaust:	Mechanical (General):
	Recommended to control exposures.	Recommended in low areas or indoors where vapors may collect.
	See mechanical.	
Protective Plastic if working with	Eye	Chemical goggles
Gloves: liquid.	Protection:	recommended. Full faceshield in addition if splashing of liquid form is possible.

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HALON

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SECTION 8 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

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Precautions to be Taken in Handling and Storage:	Store as a liquefied compressed gas in DOT approved pressure vessels away from high temperatures. If cylinder is not connected to a system, it must be safety capped to protect against actuation of valve and release of agent.
Other Precautions:	Note incompatibility information in Section 4.
Steps to be Taken in Case Material is Released or Spilled: atmosphere. Cool or remove hot, metal	Evacuate area; ventilate to outside surfaces or source of non-extinguished flames.
Waste Disposal Methods:	Dispose of in compliance with local, state, and federal regulations.

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HAZARDOUS MATERIAL IDENTIFICATION SYSTEM RATINGS

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HAZARD INDEX:

4 Severe Hazard	2 HEALTH
3 Serious Hazard	0 FLAMMABILITY
2 Moderate Hazard	0 REACTIVITY
1 Slight Hazard	
0 Minimal Hazard	

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N/A = Not Applicable NDA = No Data Available

ANSUL is a registered trademark
Form No. F-85320-7

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HELIUM NON-FLAMMABLE GAS MIXTURE - HELIUM/OXYGEN/CARBON DIOXIDE/NITROGEN

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2041059

PRODUCT NAME(S) : NON-FLAMMABLE GAS MIXTURE

Containing One or More of the Following
Components in a Nitrogen or Helium Balance
Gas: Oxygen, 0 - 23.5%; Carbon Dioxide,
0.005 - 50.0%; Methane: 0 - 2.5%

PRODUCT IDENTIFICATION : Document Number: 50015

DATE OF MSDS : 1997-03-24

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : BACHARACH, INC

ADDRESS : 625 ALPHA DRIVE

PITTSBURGH PENNSYLVANIA

U.S.A. 15238

Telephone: 412-963-2223 (INFORMATION)

Fax: 412-963-2091

EMERGENCY TELEPHONE NO. : 800-424-9300 (CHEMTREC)

MATERIAL SAFETY
DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: Non-Flammable Gas Mixture

Containing One or More of the Following Components in a Nitrogen or Helium
Balance Gas: Oxygen, 0-23.5%; Carbon Dioxide, 0.005-50.0%; Methane; 0-2.5%

SYNONYMS: Not Applicable

CHEMICAL FAMILY NAME: Not Applicable

FORMULA: Not Applicable

Document Number: 50015 (Replaces Bacharach MSDS No. 99-0196)

Note: The Material Safety Data Sheet is for this gas mixture supplied in
cylinders with 33 cubic feet (935 liters) or less gas capacity (DOT - 39
cylinders). This MSDS has been developed for various gas mixtures with the
composition of components within the ranges listed in Section 2 (Composition and
Information on Ingredients). Refer to the product label for information on the
actual composition of the product.

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HELIUM NON-FLAMMABLE GAS MIXTURE - HELIUM/OXYGEN/CARBON DIOXIDE/NITROGEN

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PRODUCT USE: Calibration of Monitoring and Research Equipment

SUPPLIER: BACHARACH, INC.
MSDS RESPONSIBILITY: AIR LIQUIDE AMERICA CORPORATION
ADDRESS: 821 Chesapeake Drive
 Cambridge, MD 21613

EMERGENCY PHONE: CHEMTREC: 1-800-424-9300

BUSINESS PHONE: 1-410-228-6400
 General MSDS Information 1-713/868-0440
 Fax on Demand: 1-800/231-1366

2. COMPOSITION and INFORMATION ON INGREDIENTS

		EXPOSURE LIMITS IN AIR					
		ACGIH		OSHA			
		TLV	STEL	PEL	STEL	IDLH	OTHER
		ppm	ppm	ppm	ppm	ppm	
CHEMICAL	Carbon	5000	30,000	5000	30,000	40,000	DFG-MAK:
NAME:	Dioxide			10,000	(Vacated		5000
CAS #:	124-38-9			(Vacated	1989 PEL)		NIOSH REL
mole %:	0.005-50.0%			1989 PEL)			TWA: 5000
							C: 30000 ppm

CHEMICAL
 NAME: **Oxygen** There are no specific exposure limits for Oxygen.
 CAS #: 7782-44-7 Oxygen levels should be maintained above 19.5%.
 mole%: 0 - 23.5%

CHEMICAL
 NAME: **Methane** There are no specific exposure limits for Methane.
 CAS #: 74-82-8 Methane is a simple asphyxiant (SA). Oxygen levels
 mole %: 0-2.5% should be maintained above 19.5%.

CHEMICAL **Nitrogen/** There are no specific exposure limits for Nitrogen or
 NAME: **Helium** Helium. These gases are simple asphyxiants (SA).
 CAS #: 7727-37-9/ Oxygen levels should be maintained above 19.5%.
 7440-59-7
 mole %: Balance

NE = Not Established. C = Ceiling Limit.
 See Section 16 for Definitions of Terms Used.

NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

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HELIUM NON-FLAMMABLE GAS MIXTURE - HELIUM/OXYGEN/CARBON DIOXIDE/NITROGEN

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3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a colorless, odorless gas. A significant hazard associated with releases of this product is the potential for over-exposure to Carbon Dioxide, a component of this gas mixture. Inhalation of Carbon Dioxide can increase respiration and heart rate, possibly resulting in circulatory insufficiency (which may lead to coma and death). At concentrations between 2-10%, Carbon Dioxide can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. If the concentration of Carbon Dioxide reaches 10% or more, suffocation can occur within minutes. Additionally, releases of this product may produce oxygen-deficient atmospheres (especially in confined spaces or other poorly-ventilated environments); individuals in such atmospheres may be asphyxiated.

HAZARDOUS MATERIAL INFORMATION SYSTEM

HEALTH	(BLUE)	[1]
FLAMMABILITY	(RED)	[0]
REACTIVITY	(YELLOW)	[0]
PROTECTIVE EQUIPMENT		[B]

EYES	RESPIRATORY	HANDS	BODY
See Section 8			

For routine industrial applications

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant route of over-exposure for this product is by inhalation.

INHALATION: Due to the small size of an individual cylinder of this product, no unusual health effects from over-exposure to the product are anticipated under routine circumstances of use. A significant hazard associated with releases of this product is the potential for over-exposure to Carbon Dioxide, a component of this gas mixture. If this product is released in a small, poorly ventilated area (i.e. an enclosed or confined space), and if the concentration of Carbon Dioxide reaches 10% or more, suffocation can occur within minutes. At concentrations between 2-10%, Carbon Dioxide can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. Carbon Dioxide initially stimulates respiration and then causes respiratory depression. High concentrations result in narcosis. Symptoms in humans are as follows:

CONCENTRATION OF CARBON DIOXIDE	OBSERVED EFFECT
1%	Slight increase in breathing rate.
2%	Breathing rate increases to 50% above normal level.
3%	Prolonged exposure can cause headache, tiredness. Breathing increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increase in blood pressure and pulse rate.
4-5%	Breathing increases to approximately four times normal rate, symptoms of intoxication become evident and slight choking

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HELIUM NON-FLAMMABLE GAS MIXTURE - HELIUM/OXYGEN/CARBON DIOXIDE/NITROGEN

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	may be felt.
5-10%	Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness.
50-100%	Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation.

Additionally, if mixtures of this product contain less than 19.5% Oxygen and are released in a small, poorly-ventilated area (i.e. an enclosed or confined space), an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The effects associated with various levels of oxygen are as follows:

**CONCENTRATION
OF OXYGEN**

OBSERVED EFFECT

12-16% Oxygen:	Breathing and pulse rate increased, muscular coordination slightly disturbed.
10-14% Oxygen:	Emotional upset, abnormal fatigue, disturbed respiration.
6-10% Oxygen:	Nausea, vomiting, collapse, or loss of consciousness.
Below 6%:	Convulsive movements, possible respiratory collapse, and death.

CONTACT WITH SKIN or EYES: Exposure to high concentrations of Carbon Dioxide (a component of this gas mixture) may cause eye irritation with symptoms such as pain, redness, and tearing. Prolonged contact of high concentrations of Carbon Dioxide with the eyes can cause damage to the retinal ganglion cells.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Over-exposure to this gas mixture may cause the following health effects:

ACUTE: Due to the small size of the individual cylinder of this product, no unusual health effects from exposure to the product are anticipated under routine circumstances of use. Inhalation of high concentrations of Carbon Dioxide (a component of this gas mixture) can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. High concentrations of Carbon Dioxide may cause eye irritation, and potential eye damage. Another significant hazard associated with this gas mixture when it contains less than 19.5% oxygen is the potential for exposure to oxygen-deficient atmospheres. Symptoms of oxygen deficiency include respiratory difficulty, ringing in ears, headaches, shortness of breath, wheezing, headache, dizziness, indigestion, nausea, unconsciousness, and death. The skin of a victim of over-exposure may have a blue color.

CHRONIC: There are currently no known adverse health effects associated with chronic exposure to this gas.

TARGET ORGANS: Respiratory system, central nervous system, and eyes.

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HELIUM NON-FLAMMABLE GAS MIXTURE - HELIUM/OXYGEN/CARBON DIOXIDE/NITROGEN

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4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS PRODUCT WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn.

No unusual health effects are anticipated after exposure to this product, due to the small cylinder size. If any adverse symptom develops after over-exposure to this product, remove victim(s) to fresh air as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation if necessary.

Victim(s) who experience any adverse effect after over-exposure to this product must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s).

5. FIRE-FIGHTING MEASURES

NFPA RATING

FLAMMABILITY

[0]

HEALTH [1]

[0] REACTIVITY

[]

OTHER

FLASH POINT, (method): Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): Not applicable.

Upper (UEL): Not applicable.

FIRE EXTINGUISHING MATERIALS: Non-flammable gas mixture. Use extinguishing media appropriate for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This gas mixture is not flammable; however, containers, when involved in fire, may rupture or burst in the heat of the fire. Pressure in a container can build-up due to heat and it may rupture if pressure relief devices should fail to function.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment.

6. ACCIDENTAL RELEASE MEASURES

LEAK RESPONSE: Due to the small size and content of the cylinder, an accidental release of this product presents significantly less risk of an oxygen deficient environment and other safety hazards than a similar release from a larger cylinder. However, as with any chemical release, extreme caution must be used during emergency response procedures. In the event of a release in which the atmosphere is unknown, and in which other chemicals are potentially involved, evacuate immediate area. Such releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a leak, clear the affected area, protect people, and respond with trained personnel.

Allow the gas mixture to dissipate. If necessary, monitor the surrounding area (and the original area of the release) for Carbon Dioxide and oxygen. Carbon Dioxide should not be above background levels and Oxygen levels must be above 19.5% before non-emergency personnel are allowed to re-enter area.

If leaking incidentally from the cylinder, contact your supplier.

7. HANDLING and USE

WORK PRACTICES AND HYGIENE PRACTICES: Be aware of any signs of dizziness or fatigue, especially if work is done in a poorly ventilated area; exposures to fatal concentrations of this product could occur without any significant warning symptoms, due to carbon dioxide over-exposure and oxygen deficiency. Do not attempt to repair, adjust, or in any other way modify the cylinders containing this gas mixture. If there is a malfunction or another type of operational problem, contact nearest distributor immediately.

STORAGE AND HANDLING PRACTICES: Cylinders should be firmly secured to prevent falling or being knocked-over. Cylinders must be protected from the environment, and preferably kept at room temperature (approximately 21 deg C, 70 deg F). Cylinders should be stored in dry, well-ventilated areas, away from sources of heat, ignition, and direct sunlight. Protect cylinders against physical damage.

Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time. These cylinders are not refillable. **WARNING!** Do not refill DOT 39 cylinders. To do so may cause personal injury or property damage.

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: **WARNING!** Compressed gases can present significant safety hazards. During cylinder use, use equipment designed for these specific cylinders. Ensure all lines and equipment are rated for proper service pressure.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely. Always use product in areas where adequate ventilation is provided.

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HELIUM NON-FLAMMABLE GAS MIXTURE - HELIUM/OXYGEN/CARBON DIOXIDE/NITROGEN

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8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: No special ventilation systems or engineering controls are needed under normal circumstances of use. As with all chemicals, use this product in well-ventilated areas. If this product is used in a poorly-ventilated area, install automatic monitoring equipment to detect the levels of Carbon Dioxide and Oxygen.

RESPIRATORY PROTECTION: No special respiratory protection is required under normal circumstances of use. Use supplied air respiratory protection if the level of Carbon Dioxide exceeds exposure limits presented in Section 2 (Composition and Information of Ingredients) and oxygen levels are below 19.5% or unknown during emergency response to a release of this product. If respiratory protection is required for emergency response to this product, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) or equivalent State standards. Respiratory selection guidelines from NIOSH for Carbon Dioxide are provided below for information.

NIOSH/OSHA RECOMMENDATIONS FOR CARBON DIOXIDE CONCENTRATIONS IN AIR:

UP TO 40,000 ppm: Supplied Air Respirator (SAR); or full-facepiece Self-Contained Breathing Apparatus (SCBA).

EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS:

Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.

ESCAPE: Escape-type SCBA.

NOTE: The IDLH concentration for Carbon Dioxide is 40,000 ppm.

EYE PROTECTION: Safety glasses.

HAND PROTECTION: No special protection is needed under normal circumstances of use.

BODY PROTECTION: No special protection is needed under normal circumstances of use.

9. PHYSICAL and CHEMICAL PROPERTIES

The following information is for Nitrogen, a main component of this gas mixture.

GAS DENSITY @ 32 deg F (0 deg C) and 1 atm: 0.072 lbs/ ft³ (1.153 kg/m³)

BOILING POINT: -320.4 deg F (-195.8 deg C)

FREEZING/MELTING POINT @ 10 psig -210 deg C (-345.8 deg F)

SPECIFIC GRAVITY (air = 1) @ 70 deg F (21.1 deg C): 0.906

pH: Not applicable.

SOLUBILITY IN WATER vol/vol @ 32 deg F (0 deg C) and 1 atm: 0.023

MOLECULAR WEIGHT: 28.01

EVAPORATION RATE (nBuAc = 1): Not applicable.

EXPANSION RATIO: Not applicable.

ODOR THRESHOLD: Not applicable.

SPECIFIC VOLUME (ft³/lb): 13.8

VAPOR PRESSURE @ 70 deg F (21.1 deg C) psig: Not applicable.

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

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HELIUM NON-FLAMMABLE GAS MIXTURE - HELIUM/OXYGEN/CARBON DIOXIDE/NITROGEN

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The following information is for Helium, a main component of this gas mixture.

GAS DENSITY @ 32 deg F (0 deg C) and 1 atm: 0.0103 lbs/cu ft (1.165 kg/m³)

BOILING POINT: -452.1 deg F (-268.9 deg C)

FREEZING/MELTING POINT (@ 10 psig): Not applicable.

SPECIFIC GRAVITY (air = 1) @ 70 deg F (21.1 deg C): 0.1381

pH: Not applicable.

SOLUBILITY IN WATER vol/vol at 32 deg F (0 deg C) and 1 atm: 0.0094

MOLECULAR WEIGHT: 4.00

EVAPORATION RATE (nBuAc = 1): Not applicable.

EXPANSION RATIO: Not applicable.

ODOR THRESHOLD: Not applicable. Odorless.

SPECIFIC VOLUME (ft³/lb): 96.7

VAPOR PRESSURE @ 70 deg F (21.1 deg C) (psig): Not applicable.

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

The following information is for the gas mixture.

APPEARANCE AND COLOR: This product is a colorless, odorless gas.

HOW TO DETECT THIS SUBSTANCE (warning properties): There are no unusual warning properties associated with a release of this product. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.

10. STABILITY and REACTIVITY

STABILITY: Normally stable in gaseous state. Moisture in the air could lead to the formation of carbonic acid from Carbon Dioxide.

DECOMPOSITION PRODUCTS: Methane, a component of this gas mixture, will thermally decompose in air to generate carbon monoxide and carbon dioxide. The other components of this gas mixture do not decompose, per se, but may react with other compounds in the heat of a fire.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Titanium will burn in Nitrogen (a component of this product). Lithium reacts slowly with Nitrogen at ambient temperatures. A component of this product (Methane) is also incompatible with strong oxidizers (i.e. chlorine, bromine pentafluoride, oxygen difluoride, and nitrogen trifluoride). Carbon Dioxide, another component of this gas mixture, will ignite and explode when heated with powdered aluminum, beryllium, cerium alloys, chromium, magnesium-aluminum alloys, manganese, thorium, titanium, and zirconium. In the presence of moisture, Carbon Dioxide will ignite with cesium oxide. Metal acetylides will also ignite and explode on contact with Carbon Dioxide.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

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HELIUM NON-FLAMMABLE GAS MIXTURE - HELIUM/OXYGEN/CARBON DIOXIDE/NITROGEN

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11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following toxicology data are available for the components of this product:

METHANE: There are no specific toxicology data for Methane. Methane is a simple asphyxiant, which acts to displace oxygen in the environment.
Carbon Dioxide: This gas is a simple asphyxiant with physiological effects at high concentration.

TCLo(inhalation, rat) = 6 pph/24 hours; reproductive and teratogenic effects
LCLo(inhalation, human) = 9 pph/ 5 minutes
LCLo(inhalation, mammal) = 90,000 ppm/5 minutes

NITROGEN: There are no specific toxicology data for Nitrogen. Nitrogen is a simple asphyxiant, which acts to displace oxygen in the environment.

HELIUM: There are no specific toxicology data for Helium. Helium is a simple asphyxiant (SA), which acts to displace oxygen in the environment

SUSPECTED CANCER AGENT: The components of this gas mixture are not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, and IARC; therefore, they are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: Not applicable.

SENSITIZATION TO THE PRODUCT: The components of this gas mixture are not known to be sensitizers.

REPRODUCTIVE

TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: This product is not expected to cause mutagenic effects in humans.

Embryotoxcity: This product has not been reported to cause embryotoxic effects.

Teratogenicity: This product is not expected to cause teratogenic effects in humans. Clinical studies involving test animals exposed to high concentrations of Carbon Dioxide indicate teratogenic effects.

Reproductive Toxicity: This product is not expected to cause adverse reproductive effects in humans. Clinical studies involving test animals exposed to high concentrations of Carbon Dioxide indicate reproductive effects.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

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HELIUM NON-FLAMMABLE GAS MIXTURE - HELIUM/OXYGEN/CARBON DIOXIDE/NITROGEN

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MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Acute or chronic respiratory conditions may be aggravated by over-exposure to the components of this product. Additionally, over-exposure to Carbon Dioxide (a component of this gas mixture) may aggravate eye disorders and central nervous system conditions.

RECOMMENDATIONS TO PHYSICIANS: Administer oxygen, if necessary; treat symptoms and eliminate exposure.

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, Biological Exposure Indices (BEIs) are not applicable for this gas mixture.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: The components of this gas mixture occur naturally in the atmosphere. The gas will be dissipated rapidly in well-ventilated areas. The following environmental data are applicable to the components of this product.

Oxygen: Water Solubility = 1 volume Oxygen/32 volumes water at 20 deg C. Log Kow = -0.65

Nitrogen: Water Solubility = 2.4 volumes Nitrogen/100 volumes water at 0 deg C. 1.6 volumes Nitrogen/100 volumes water at 20 deg C.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: No evidence is currently available on this product's effects on plant and animal life.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on this product's effects on aquatic life.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Cylinders with undesired residual product may be safely vented outdoors with the proper regulator. For further information, refer to Section 16 (Other Information).

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME:	Compressed gases, n.o.s. (Nitrogen, Carbon Dioxide) or (Helium, Carbon Dioxide)
HAZARD CLASS NUMBER and DESCRIPTION:	2.2 (Non-Flammable Gas)
UN IDENTIFICATION NUMBER:	UN 1956
PACKING GROUP:	Not applicable.
DOT LABEL(S) REQUIRED:	Non-Flammable Gas

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HELIUM NON-FLAMMABLE GAS MIXTURE - HELIUM/OXYGEN/CARBON DIOXIDE/NITROGEN

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NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996): 126

MARINE POLLUTANT: The components of this gas mixture are not classified by the DOT as Marine Pollutants (as defined by 49 CFR 172.101, Appendix B).

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

Note: DOT 39 Cylinders ship in a strong outer carton (overpack). Pertinent shipping information goes on the outside of the overpack. DOT 39 Cylinders do not have transportation information on the cylinder itself.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. Use the above information for the preparation of Canadian Shipments.

15. REGULATORY INFORMATION

SARA REPORTING REQUIREMENTS: The components of the gas mixture are subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

COMPONENT	SARA 302	SARA 304	SARA 313
Oxygen	NO	NO	NO
Methane	NO	NO	NO
Carbon Dioxide	NO	NO	NO
Helium	NO	NO	NO
Nitrogen	NO	NO	NO

SARA Threshold Planning Quantity: Not applicable.

TSCA INVENTORY STATUS: The components of this gas mixture are listed on the TSCA Inventory.

CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

OTHER U.S. FEDERAL REGULATIONS:

Methane is subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity for this gas is 10,000 pounds.

This gas mixture does not contain any Class I or Class II ozone depleting chemicals (40 CFR part 82).

Nitrogen, Helium, Carbon Dioxide and Oxygen are not listed as Regulated Substances, per 40 CFR, Part 68, of the Risk Management for Chemical Releases. Methane is are listed under this regulation in Table 3 as a

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HELIUM NON-FLAMMABLE GAS MIXTURE - HELIUM/OXYGEN/CARBON DIOXIDE/NITROGEN

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Regulated Substance (Flammable Substance), in quantities of 10,000 lbs (4,553 kg) or greater.

OTHER CANADIAN REGULATIONS: This gas mixture is categorized as a Controlled Product, Hazard Class A, as per the Controlled Product Regulations.

STATE REGULATORY INFORMATION: The components of this gas mixture are covered under the following specific State regulations:

Alaska - Designated Toxic and Hazardous Substances: Methane, Carbon Dioxide, Helium.
California - Permissible Exposure Limits for Chemical Contaminants: Nitrogen, Methane, Carbon Dioxide, Helium.
Florida - Substance List: Oxygen, Carbon Dioxide, Helium.
Illinois - Toxic Substance List: Carbon Dioxide, Helium.
Kansas - Section 302/313 List: No.
Massachusetts - Substance List: Oxygen, Methane, Carbon Dioxide, Helium.
Minnesota - List of Hazardous Substances: Methane, , Carbon Dioxide, Helium.
Missouri - Employer Information/Toxic Substance List: Methane, Carbon Dioxide, Helium.
New Jersey - Right to Know Hazardous Substance List: Oxygen, Nitrogen, Methane, Carbon Dioxide, Helium.
North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.
Pennsylvania - Hazardous Substance List: Oxygen, Nitrogen, Methane, Carbon Dioxide, Helium.
Rhode Island - Hazardous Substance List: Oxygen, Nitrogen, Methane, Carbon Dioxide, Helium.
Texas - Hazardous Substance List: Carbon Dioxide.
West Virginia - Hazardous Substance List: Carbon Dioxide.
Wisconsin - Toxic and Hazardous Substances: Carbon Dioxide.

CALIFORNIA PROPOSITION 65: No component of this product is on the California Proposition 65 lists.

16. OTHER INFORMATION

INFORMATION ABOUT DOT-39 NRC (Non-Refillable Cylinder) PRODUCTS

DOT 39 cylinders ship as hazardous materials when full. Once the cylinders are relieved of pressure (empty) they are not considered hazardous material or waste. Residual gas in this type of cylinder is not an issue because toxic gas mixtures are prohibited. Calibration gas mixtures typically packaged in these cylinders are Nonflammable n.o.s., UN 1956. A small percentage of calibration gases packaged in DOT 39 cylinders are flammable or oxidizing gas mixtures.

For disposal of used DOT-39 cylinders, it is acceptable to place them in a landfill if local laws permit. Their disposal is no different than that employed with other DOT containers such as spray paint cans, household aerosols, or disposable cylinders of propane (for camping, torch etc.). When feasible, we recommended recycling for scrap metal content. Air Liquide America will do this for any customer that wishes to return cylinders to us prepaid. All that is required is a phone call to make arrangements so we may anticipate arrival. Scrapping cylinders involves some preparation before the metal dealer may accept

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HELIUM NON-FLAMMABLE GAS MIXTURE - HELIUM/OXYGEN/CARBON DIOXIDE/NITROGEN

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them. We perform this operation as a service to valued customers who want to participate.

MIXTURES: When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

Further information about the handling of compressed gases can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703) 412-0900.

P-1	"Safe Handling of Compressed Gases in Containers"
AV-1	"Safe Handling and Storage of Compressed Gases"
	"Handbook of Compressed Gases"

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc.
 9163 Chesapeake Drive, San Diego, CA 92123-1002
 619/565-0302
 Fax on Demand: 1-800/231-1366

This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of Air Liquide America Corporation's knowledge, the information contained herein is reliable and accurate as of this date

however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this product is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.

NON-FLAMMABLE GAS MIXTURE MSDS - 50015 EFFECTIVE DATE: MARCH 24, 1997

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HYDRAULIC OIL

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

***** IDENTIFICATION *****

MSDS RECORD NUMBER : 2313097

PRODUCT NAME(S) : BP AW HYDRAULIC OIL 32
LUBRICATING OIL; HYDRAULIC OIL

PRODUCT IDENTIFICATION : MSDS No. 0494105 US/ENGLISH
CAS NUMBER: 64741-88-4

DATE OF MSDS : 2000-01-24

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-05-31

***** MANUFACTURER INFORMATION *****

MANUFACTURER : BP Lubricants

ADDRESS : 28100 Torch Parkway
Warrenville Illinois
U.S.A. 60555-4015
Telephone: 630-434-6377 (OTHER PRODUCT
SAFETY INFORMATION)

EMERGENCY TELEPHONE NO. : 312-856-2200 (HEALTH INFORMATION, USA)
703-527-3887 (SPILL INFORMATION,
CHEMTREC, USA)

***** MATERIAL SAFETY DATA *****

MSDS No. 0494105 US/ENGLISH

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER/SUPPLIER:	EMERGENCY HEALTH INFORMATION:
BP Lubricants	1 (800) 447-8735
28100 Torch Parkway	
Warrenville, Illinois 60555-4015	EMERGENCY SPILL INFORMATION:
U.S.A.	1 (800) 424-9300 CHEMTREC (USA)
	OTHER PRODUCT SAFETY INFORMATION:
	1 (630) 434-6377 (USA)

SUBSTANCE: BP AW HYDRAULIC OIL 32

TRADE NAMES/SYNONYMS:
LUBRICATING OIL; HYDRAULIC OIL

CREATION DATE: Jan 24 2000

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HYDRAULIC OIL

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REVISION DATE: Feb 01 2000

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: SOLVENT-REFINED HEAVY PARAFFINIC DISTILLATE

CAS NUMBER: 64741-88-4

EC NUMBER (EINECS): 265-090-8

EC INDEX NUMBER: 649-454-00-7

PERCENTAGE: 98.0-100.0

(See Section 8, "Exposure Controls, Personal Protection", for exposure guidelines)

SECTION 3 HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=0 FIRE=1 REACTIVITY=0

EMERGENCY OVERVIEW:

COLOR: yellow

PHYSICAL FORM: oil

ODOR: hydrocarbon odor

MAJOR HEALTH HAZARDS: Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.

POTENTIAL HEALTH EFFECTS:

INHALATION:

No significant health hazards identified.

SKIN CONTACT:

Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis. High pressure skin injections are serious medical emergencies. Injury will not appear serious at first; within a few hours, tissue will become swollen, discolored and extremely painful.

EYE CONTACT:

No significant health hazards identified.

INGESTION:

Ingestion causes gastrointestinal irritation and diarrhea.

SECTION 4 FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Get medical attention.

SKIN CONTACT: Wash exposed skin with soap and water. Remove contaminated clothing and thoroughly clean and dry before reuse. Accidental high pressure injection through the skin requires immediate medical attention. Get medical attention if irritation develops.

EYE CONTACT: Flush eyes with plenty of water.

INGESTION: If swallowed, drink plenty of water. Get immediate medical attention. Induce vomiting only at the instructions of a physician. Do not

HYDRAULIC OIL

give anything by mouth to unconscious or convulsive person.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Slight fire hazard.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical, regular foam, water

FIRE FIGHTING: Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Water or foam may cause frothing.

FIRE FIGHTING PROTECTIVE EQUIPMENT: Firefighters should wear full bunker gear, including a positive pressure self contained breathing apparatus.

FLASH POINT: 468 F (242 C)

LOWER FLAMMABLE LIMIT: 1 % by volume

UPPER FLAMMABLE LIMIT: 7 % by volume

FLAMMABILITY CLASSIFICATION: Not Flammable.

HAZARDOUS COMBUSTION PRODUCTS:

Thermal decomposition products or combustion: hydrocarbons, oxides of carbon, oxides of nitrogen, oxides of phosphorus, oxides of sulfur, oxides of zinc

SECTION 6 ACCIDENTAL RELEASE MEASURES

Stop leak if possible without personal risk. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Keep unnecessary people away, isolate hazard area and deny entry. Large spills: Dike for later disposal. Cover with plastic sheet or tarp to minimize spreading and protect from contact with water. Prevent spreading by diking, ditching, or absorbing on inert materials.

SECTION 7 HANDLING AND STORAGE

STORAGE: Avoid extremes in storage temperatures. Store in a cool, dry, well-ventilated area. Store away from heat, ignition sources, and open flame in accordance with applicable regulations. Keep container tightly closed. Do not store in unlabeled containers.

HANDLING: Keep away from all ignition sources. Use only with adequate ventilation. Do not eat, drink or smoke in areas of use or storage. Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet facilities. Wash thoroughly after work using soap and water. Remove contaminated clothing and thoroughly clean and dry before reuse.
SPECIAL PRECAUTIONS: Empty containers may contain toxic,

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HYDRAULIC OIL

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flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld, reuse or dispose of containers unless adequate precautions are taken against these hazards.

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

SOLVENT-REFINED HEAVY PARAFFINIC DISTILLATE:

MINERAL OIL MIST:

5 mg/m3 OSHA TWA

5 mg/m3 ACGIH TWA (Notice of Intended Changes 1993-1994)

10 mg/m3 ACGIH STEL (Notice of Intended Changes 1993-1994)

5 mg/m3 MEXICO TWA

10 mg/m3 MEXICO STEL

VENTILATION: Use with adequate ventilation. Control airborne concentrations below the exposure guidelines.

EYE PROTECTION: None required; however, use of eye protection is good industrial practice.

CLOTHING: Avoid repeated or prolonged contact. Wear protective clothing if prolonged or repeated contact is likely.

GLOVES: Wear protective gloves if prolonged or repeated contact is likely.

PROTECTIVE MATERIAL TYPES: neoprene

RESPIRATOR: Use with adequate ventilation.

Avoid breathing vapor or mist.

If ventilation is inadequate, use a NIOSH certified respirator with an organic vapor cartridge and P95 particulate filter.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid

COLOR: yellow

PHYSICAL FORM: oil

ODOR: hydrocarbon odor

BOILING POINT: Not available

FREEZING POINT: Not available

POUR POINT: -26 F (-32 C)

VAPOR PRESSURE: <1 mmHg @ 20 C

VAPOR DENSITY (air=1): >1

SPECIFIC GRAVITY (water=1): 0.87

BULK DENSITY: 0.880 g/cm3

WATER SOLUBILITY: insoluble in cold water

PH: Not available

VOLATILITY: negligible

ODOR THRESHOLD: Not available

EVAPORATION RATE: slower than ether

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HYDRAULIC OIL

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VISCOSITY: 27.3 cP @ 40 C

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Avoid contact with incompatible materials.

INCOMPATIBILITIES: strong oxidizing materials

HAZARDOUS DECOMPOSITION:

Thermal decomposition products or combustion: hydrocarbons, oxides of carbon, oxides of nitrogen, oxides of phosphorus, oxides of sulfur, oxides of zinc

POLYMERIZATION: Will not polymerize.

SECTION 11 TOXICOLOGICAL INFORMATION

EYE IRRITATION: Testing not conducted. See Other Toxicity Data.

SKIN IRRITATION: Testing not conducted. See Other Toxicity Data.

DERMAL LD50: Testing not conducted. See Other Toxicity Data.

ORAL LD50: Testing not conducted. See Other Toxicity Data.

INHALATION LC50: Testing not conducted. See Other Toxicity Data.

OTHER TOXICITY DATA:

Specific toxicity tests have not been conducted on this product. Our hazard evaluation is based on information from similar products, the ingredients, technical literature, and/or professional experience.

No component of this product present at levels greater than 0.1% is identified as a carcinogen by the U.S. National Toxicology Program, the U.S. Occupational Safety and Health Act, or the International Agency on Research on Cancer (IARC).

SECTION 12 ECOLOGICAL INFORMATION

Ecological testing has not been conducted on this product by BP Amoco.

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HYDRAULIC OIL

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SECTION 13 DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

SECTION 14 TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION: Not regulated.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS: Not regulated.

LAND TRANSPORT ADR/RID: Not regulated.

AIR TRANSPORT IATA/ICAO: Not regulated.

MARITIME TRANSPORT IMDG: Not regulated.

SECTION 15 REGULATORY INFORMATION

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR Part 302.4): This product is not reportable under 40 CFR Part 302.4.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR Part 355): This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA TITLE III SECTION 311/312 HAZARDOUS CATEGORIZATION (40 CFR Part 370):

ACUTE: N
CHRONIC: N
FIRE: N
REACTIVE: N
SUDDEN RELEASE: N

SARA TITLE III SECTION 313 (40 CFR Part 372): This product is not regulated under Section 313 of SARA and 40 CFR Part 372.

STATE REGULATIONS:

California Proposition 65: N

TSCA INVENTORY STATUS: Listed on inventory.

OSHA HAZARD COMMUNICATION STANDARD: Contains a component listed by ACGIH.
Contains a component listed by OSHA.

EC INVENTORY (EINECS/ELINCS): Not determined.

JAPAN INVENTORY (MITI): Not determined.

AUSTRALIA INVENTORY (AICS): Not determined.

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HYDRAULIC OIL

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KOREA INVENTORY (ECL): Not determined.

CANADA INVENTORY (DSL): Not determined.

PHILIPPINE INVENTORY (PICCS): Not determined.

CHINA INVENTORY (IECS): Not determined.

SECTION 16 OTHER INFORMATION

Prepared by: Product Stewardship and Toxicology

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This Material Safety Data Sheet conforms to the requirements of ANSI Z400.1. NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

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J E T B F U E L

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2483109

PRODUCT NAME(S) : TURBINE FUEL AVIATION, WIDE CUT TYPE
ESSO TURBO FUEL B
ESSO JET B
JET B
TURBO FUEL B
TURBO FUEL B F40
TURBO FUEL B JP4
ESSO TURBO FUEL B <FSII>
JET B <FSII>
AVIATION TURBINE FUEL <JP4>
CAN/CGSB-3.22 GRADE F40
ESSO JET B <FSII>

PRODUCT IDENTIFICATION : MSDS Number: 08524

DATE OF MSDS : 2000-06-15

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-12-14

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Imperial Oil (Products Division)

ADDRESS : 111 St Clair Avenue West
Toronto Ontario
Canada M5W 1K3
Telephone: 416-968-4111

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : Imperial Oil (Products Division)

ADDRESS : 111 St Clair Avenue West
Toronto Ontario
Canada M5W 1K3
Telephone: 416-968-4111

*** MATERIAL SAFETY DATA ***

Date Prepared: June 15, 2000
Supersedes: April 21, 1999
MSDS Number: 08524

JET B FUEL

1. PRODUCT INFORMATION

Product Identifier: TURBINE FUEL AVIATION, WIDE CUT TYPE
ESSO TURBO FUEL B
ESSO JET B
JET B
TURBO FUEL B
TURBO FUEL B F40
TURBO FUEL B JP4
ESSO TURBO FUEL B <FSII>
JET B <FSII>
AVIATION TURBINE FUEL <JP4>
CAN/CGSB-3.22 GRADE F40
ESSO JET B <FSII>

Application and Use: Aviation turbine fuel

Product Description: A mixture of aliphatic and aromatic hydrocarbons and additives.

REGULATORY CLASSIFICATION

WHMIS:

Class B, Division 2: Flammable Liquids.
Class D, Division 2, Subdivision A: Very Toxic Material.
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, AVIATION, TURBINE ENGINES
Class: 3
Packing Group: II
PIN Number: UN1863

Please be aware that other regulations may apply.

TELEPHONE NUMBERS

Emergency 24 hr. (519) 339-2145
Technical Info. (800) 268-3183

MANUFACTURER/SUPPLIER:

IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(416) 968-4441

JET B FUEL

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	40-70 V/V	8008-20-6 LD50:>5g/kg,oral,rat
Naphtha, full range	30-60 V/V	64741-42-0
Ethylene Glycol Monomethyl Ether	0-0.15 V/V	109-86-4 LD50:2.4g/kg,orl,rat LD50:0.8g/kg,orl,rab
Diethylene glycol monomethyl ether	0-0.15 V/V	111-77-3 LD50:9.2g/kg,orl,rat LD50:6.6g/kg,skn.rbt

3. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State: Liquid
Specific gravity: not available
Viscosity: 0.60 cSt at 40 deg C
Vapour Density: 4
Boiling Point: 40 to 270 deg C
Evaporation rate: <1 (1= n-butylacetate)
Solubility in water: negligible
Freezing/Pour Point: -58 deg C ASTM D 2386
Odour Threshold: not available
Vapour Pressure: 21 kPa at 38 deg C
Density: 0.78 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.

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JET B FUEL

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EYE CONTACT:

Slightly irritating, but will not injure eye tissue.

SKIN CONTACT:

Irritating.

Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis).

Low toxicity.

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:

May contain ethylene glycol monomethyl ether (EGME). Prolonged and/or repeated exposure through inhalation or extensive skin contact with EGME may result in toxic effects on the blood, the blood producing system, the kidneys, the male reproductive system and the embryo/fetus.

Contains benzene. Human health studies (epidemiology) indicate that prolonged and/or repeated overexposures to benzene may cause damage to the blood producing system and serious blood disorders, including leukemia.

Animal tests suggest that prolonged and/or repeated overexposures to benzene may damage the embryo/fetus. The relationship of these animal studies to humans has not been fully established.

Contains n-hexane. Prolonged and/or repeated exposures may cause damage to the peripheral nervous system (e.g. fingers, feet, arms etc.).

Contains diethylene glycol monomethyl ether (DIEGME). Prolonged and repeated exposure through inhalation or extensive skin contact with DIEGME may result in toxic effects on the kidneys, the reproductive system and/or the embryo/fetus.

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:

Manufacturer recommends:

100 ppm based on composition.

For Benzene (skin) 1 ppm TWA for 8 hour workday.

ACGIH recommends:

For n-Hexane (skin), 50 ppm (176 mg/m3).

For Benzene, ACGIH recommends a TWA of 0.5 ppm (1.6 mg/m3), (skin), and categorizes it as a confirmed human carcinogen.

For 2-Methoxyethanol, (skin) 5 ppm (16 mg/m3).

Local regulated limits may vary.

JET B FUEL

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.

Use explosion-proof ventilation equipment.

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.

Store and load at normal (up to 38 deg C) temperature and at atmospheric pressure.

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JET B FUEL

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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.

Vapours or dust may be harmful or fatal. Warn occupants of downwind areas.

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:

Eliminate all sources of ignition. Vapours or dust may be harmful or fatal. Warn occupants and shipping in downwind areas.

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: -18 deg C COC ASTM D92

Autoignition: NA **Flammable Limits:** LEL: 0.6% UEL: 8.0%

GENERAL HAZARDS:

Extremely flammable; material will readily ignite at normal temperatures. Flammable Liquid; may release vapours that form flammable mixtures at or above the flash point.

Decomposes; flammable/toxic gases will form at elevated temperatures (thermal decomposition).

Toxic gases will form upon combustion.

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

JET B FUEL

FIRE FIGHTING:

Use water spray to cool fire exposed surfaces and to protect personnel. Shut off fuel to fire if possible to do so without hazard. If a leak or spill has not ignited use water spray to disperse the vapours.

Either allow fire to burn out under controlled conditions or extinguish with foam or dry chemical. Try to cover liquid spills with foam.

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 and traces of 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:

See: Hazardous Combustion Products

9. NOTES

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

Boiling point change.

REVISION SUMMARY:

Since 21 April 1999, this MSDS has been revised in Section(s):

2, 3

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JET B FUEL

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10. PREPARATION

Date Prepared: June 15, 2000
Prepared by: Lubricants & Specialties
IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(800) 268-3183

CAUTION: " The information contained herein relates only to this product or material and may not be valid when used in combination with any other product or material or in any process. If the product is not to be used for a purpose or under conditions which are normal or reasonably foreseeable, this information cannot be relied upon as complete or applicable. For greater certainty, uses other than those described in Section 1 must be reviewed with the supplier. The information contained herein is based on the information available at the indicated date of preparation. This MSDS is for the use of Imperial Oil customers and their employees and agents only. Any further distribution of this MSDS by Imperial Oil customers is prohibited without the written consent of Imperial Oil."

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LATEX PAINTS - ALL

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 1641578

PRODUCT NAME(S) : LATEX PAINTS - ALL

Water based paint

PRODUCT IDENTIFICATION : #12

PRODUCT CODES C100, C105, C150, D5000,
D5050, D5090, D5100, D5150, D5300, D5400,
D6050

DATE OF MSDS : 1998-02-02

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Para Inc

ADDRESS : 11 Kenview Boulevard

Brampton Ontario

Canada L6T 5G5

Telephone: 905-792-0940 (Information)

EMERGENCY TELEPHONE NO. : 905-792-0940

613-996-6666 (CANUTEC, after hours, in
case of emergency only)

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SECTION I - PRODUCT AND PREPARATION INFORMATION

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TRADE NAME : LATEX PAINTS - ALL

PREPARATION DATE.. Feb. 2, 1998 **PREPARED BY**...Don Warren

SUPERCEDES.. March 27, 1996 **REASON**...Additional product codes

PRODUCT CODES.. C100, C105, C150, D5000, D5050, D5090, D5100,
D5150, D5300, D5400, D6050

(Note: Where applicable, the above product codes also represent
tint base codes for each.)

CHEMICAL NAME.. Water based paint **HMIS RATING:** Health...1

CHEMICAL FAMILY.. Mixture **Flammability**...0

FORMULA.. Not applicable **Reactivity**...0

PRODUCT USE.. Decorative and/or protective coatings for various
substrates.

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LATEX PAINTS - ALL

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SECTION II - HAZARDOUS INGREDIENTS

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CHEMICAL IDENTITY/CAS NUMBER %(WT) LC50 (ppm) LD50 (mg/kg)
No hazardous ingredients

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SECTION III - PHYSICAL DATA

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PHYSICAL STATE (room temperature).. liquid
ODOUR AND APPEARANCE.. opaque liquid, mild odour
BOILING POINT - (centigrade).. > 100'C
FREEZING POINT - (centigrade).. < 0'C
PERCENT VOLATILE BY VOLUME.. 60 - 75%
SPECIFIC GRAVITY.. 1.0 - 1.6
EVAPORATION RATE (n-butyl acetate = 1).. 0.36
VAPOUR PRESSURE.. 2.3 KPa
VAPOUR DENSITY (air = 1).. n/a
pH.. 8-9
COEFFICIENT OF OIL/WATER DISTRIB'N.. n/a
SOLUBILITY IN WATER.. partially
COATINGS VOC (less water).. 25 - 236 gm/L

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SECTION IV - FIRE OR EXPLOSION HAZARDS

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CONDITIONS OF FLAMMABILITY.. Wet paint is non-flammable, but
dried film may burn if exposed to flame, but will not support
combustion.
EXTINGUISHING MEDIA.. n/a
HAZARDOUS COMBUSTION PRODUCTS.. Carbon monoxide, carbon dioxide,
smoke.
SPECIAL FIRE FIGHTING PROCEDURES.. n/a
FLASH POINT (method).. n/a
UPPER FLAMMABILITY LIMITS(UEL).. n/a
LOWER FLAMMABILITY LIMITS(LEL).. n/a
AUTO-IGNITION TEMPERATURE.. n/a
SENSITIVITY TO MECHANICAL IMPACT.. none
SENSITIVITY TO STATIC DISCHARGE.. n/a

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SECTION V - REACTIVITY DATA

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STABILITY.. Stable
CONDITIONS TO AVOID.. Very high temperatures
INCOMPATIBLE SUBSTANCES.. Strong oxidizing agents

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LATEX PAINTS - ALL

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HAZARDOUS DECOMPOSITION PRODUCTS.. Not applicable
HAZARDOUS POLYMERIZATION.. Will not occur

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SECTION VI - TOXICOLOGICAL PROPERTIES

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SKIN CONTACT.. none
SKIN ABSORPTION.. none
EYE CONTACT.. Irritating but will not injure eye tissue.
INHALATION.. none
INGESTION.. May cause nausea, vomiting.

EFFECTS OF ACUTE EXPOSURE.. none
EFFECTS OF CHRONIC EXPOSURE.. none

EXPOSURE LIMITS: CHEMICAL COMPONENT OSHA/PEL ACGIH/TLV
 No hazardous ingredients

IRRITANCY.. May cause eye irritation.
SENSITIZATION.. none
CARCINOGENICITY.. none REPRODUCTIVE TOXICITY...none
TERATOGENICITY.. none MUTAGENICITY...none
TOXICOLOGICALLY SYNERGISTIC PRODUCTS.. none known

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SECTION VII - PREVENTIVE MEASURES

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HAND PROTECTION.. Not normally required.
EYE PROTECTION.. Safety glasses or goggles.
RESPIRATORY PROTECTION.. Combined dust and organic vapour
canister when spraying or using in a poorly ventilated area.
BODY PROTECTION.. No special clothing required.
FOOT PROTECTION.. Safety shoes if handling pails.
VENTILATION CONTROLS.. Good local ventilation, exhaust fans
and/or open windows.
STEPS TO BE TAKEN IN CASE OF A LEAK OR SPILL.. Scoop up and
return to original container, soak up residue with absorbent.
Prevent from entering storm or sanitary sewers.
WASTE DISPOSAL METHOD.. Approved waste disposal firm.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE.. Keep from
freezing.
SPECIAL SHIPPING REQUIREMENTS.. Keep from freezing.

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SECTION VIII - FIRST AID MEASURES

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SKIN CONTACT.. Wash with water.
EYE CONTACT.. Rinse with clean water for 15 minutes. Get medical
attention if irritation persists.
INHALATION.. Remove to fresh air.
INGESTION.. Consult a physician.

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LATEX PAINTS - ALL

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SECTION IX - REGULATORY INFORMATION

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WHMIS CLASSIFICATION.. Not a controlled product
TDG CLASSIFICATION.. N/R
TDG SHIPPING NAME.. N/R
UN NUMBER.. N/R
TSCA (U.S.A.).. All ingredients on TSCA inventory
CEPA (CANADA).. All ingredients on DSL (Domestic Substances List)

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DISCLAIMER: All information, recommendations and suggestions appearing herein concerning these products are based upon tests and data believed to be reliable. Therefore it is the user's responsibility to determine the safety and suitability for his or her own use of these products. Since the actual use or misuse is beyond our control, no guarantee, expressed or implied, is made by Para Inc. as to the effects of such use, nor does Para Inc. assume any liability arising out of the use or misuse by others of this product.

.: []; Class: [] Div.: []; Class: [] Div.: [].

TRANSPORTATION :

	UN/NA	CLASS	P.G.	SHIPPING NAME
	-----	-----	----	-----
TDG :	2211	9.1	III	Polymeric beads, expandable
IATA:	2211	9	III	Polymeric beads, expandable
IMDG:	2211	9	III	Polymeric beads, expandable

SPECIAL PROVISIONS :
44

PREPARED / REVISED BY: BASF CANADA INC. (416) 675-3611
DATE : 1999/01/28

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LEAD ACID BATTERIES

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 624438
PRODUCT NAME(S) : Lead Acid type battery
PRODUCT IDENTIFICATION : T-MS-105
DATE OF MSDS : 1993-02-08

*** MANUFACTURER INFORMATION ***

MANUFACTURER : GNB Batteries (Canada) Inc
ADDRESS : 275 Lewis Street
Fort Erie Ontario
Canada L2A 5N6
Telephone: 905-871-5600
Fax: 905-871-6310

*** MATERIAL SAFETY DATA ***

T-MS-105 - EFFECTIVE February 8, 1993
REPLACING: March 15, 1992
TECHNICAL BULLETIN: Material Safety
Data Sheet
SUBJECT TO CHANGE WITHOUT NOTICE

1. GENERAL INFORMATION

- a) Product Name: Lead acid type battery
- b) Product Type: (I) Wet Cells (Stationary, Motive Power and Railroad type batteries)
(II) Sealed modules
- c) Application DC Power Source (Rechargeable)

2. BASIC COMPONENTS*

- a) Lead alloy: Major component - Lead
Minor components -
Antimony or calcium and traces of arsenic (for wet cells)
Calcium, antimony and cadmium (for sealed modules)
- b) Lead dioxide (active material)
- c) Copper, stainless steel, brass etc. (used as hardware and other external components)
- d) Sulfuric Acid (battery electrolyte)
- e) Plastic materials like styrene-acrylonitrile copolymer, polypropylene or polycarbonate (battery container); synthetic rubber separators, glass mats, rubber washers etc. are also used.

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LEAD ACID BATTERIES

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* percentage of these components vary with the type of product.

3. PHYSICAL AND TOXICOLOGICAL DATA

- a) Lead: Toxic, TLV 0.1 mg/M3, S.G. 11.34, m.p. 327 deg C.
- b) Antimony: Toxic, TLV 0.5 mg/M3, S.G. 6.68, m.p. 630 deg C
- c) Calcium: Nontoxic, m.p. 842 deg C, S.G. 1.54.
- d) Cadmium: Toxic, TLV 0.2 mg/M3, S.G. 8.64, m.p. 321 deg C.
Note: Physical and toxicological properties of a) to d) above vary with alloy composition.
- e) Sulfuric acid: Corrosive, TLV 1.0 mg/M3, reacts with alkaline materials like caustic soda or soda ash; soluble in water. Battery electrolyte is 29-42 percent solution water, S.G. 1.215 - 1.300
- f) Plastic Container Materials: Plastic materials used for battery containers are nontoxic solids. They are attacked by organic solvents and may be flammable if exposed to excessive heat or open flames.

(TLV = Threshold Limiting Value)

(SG = Specific Gravity)

(m.p. = melting point)

4. BY-PRODUCTS

Hydrogen and Oxygen Gasses These gases generated at the end of charge of the battery could form explosive mixtures with air if proper ventilation is not provided. Explosive range for hydrogen in air is 4.1-74.2%.

5. PRECAUTIONS

- a) Cells should not be exposed to excessive heat, open flames or freezing conditions. ABSOLYTE (R) type sealed modules however can withstand freezing conditions.
- b) Cell jars are likely to be damaged on contact with organic solvents or detergents. Do not use such materials for the purpose of cleaning the cells.
- c) Use protective gloves, acid resistant clothes and boots as well as safety glasses while working in the battery room.
- d) Acid spills should be carefully neutralized by soda ash or baking soda. Neutralizing chemicals should not be allowed to enter the cells as they chemically react with the electrolyte.

6. HEALTH HAZARDS

- a) Inhalation of sulfuric acid vapour can cause respiratory irritation. Use of mask and proper ventilation minimizes the possibility of inhalation of acid fumes. Do not operate the battery in closed space and in case of inhalation of acid fumes, remove the person to fresh air.
- b) Splashing of electrolyte into the eyes or skin could cause irritation and severe burns. Affected area should be washed thoroughly with cold water.

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LEAD ACID BATTERIES

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Medical attention required in cases of eye exposure or severe skin exposure.

c) Lead, arsenic, antimony and cadmium also have toxic effects, but, emission of these materials from batteries is minimal.

7. FIRE AND EXPLOSION DATA

a) Plastic containers are flammable if exposed to extreme heat or open flame. Use carbon dioxide or dry chemicals only as fire extinguishers.

b) Gases generated at the end of charge could form explosive mixtures with air. Sources of sparks, flames etc. should be avoided. Smoking is not permitted in the battery room.

8. DISPOSAL AT END OF USE

Contact GNB at Fort Erie or the nearest sales office for procedure to be followed for the disposal of used batteries in accordance with Government regulations.

9. GENERAL REMARKS

Lead acid batteries as such pose no hazards to either health or the

environment. All toxic and corrosive components are contained within the cell jars and their emission is minimal. With proper maintenance and use, the battery will function as a DC power source for many years.

NOTE

DUE TO THE NEW MANUFACTURING TECHNOLOGY, GNB'S SEALED ABSOLYTE (R) MODULES REQUIRE CONSIDERABLE SMALLER QUANTITIES OF ELECTROLYTE. AS A CONSEQUENCE, POSSIBILITY OF SPILLAGE OR HYDROGEN EVOLUTION IS VERY MUCH REDUCED. THEY CAN BE STACKED IN ANY POSITION AND ARE ALSO AVAILABLE IN FLAME RESISTANT CONTAINERS. ALL OTHER PRECAUTIONS RECOMMENDED FOR WET CELLS ARE APPLICABLE TO SEALED ABSOLYTE (R) MODULES AS WELL.

LEAD CONCENTRATE



MATERIAL SAFETY DATA SHEET

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identity: Polaris Lead Concentrate

Manufacturer:

Cominco Mining Partnership
Polaris Operations
Polaris, NU
X0A 0Y0
Emergency Telephone: (250) 364-4214

Supplier:

Teck Cominco Metals Ltd.
1500 - 120 Adelaide Street, W.
Toronto, Ontario
M5H 1T1

MSDS Preparer:

Teck Cominco Metals Ltd.
600 - 200 Burrard Street
Vancouver, British Columbia
V6C 3L7

Date of MSDS Preparation: July 23, 1997

Product Use: Lead concentrate is used in the production of lead metal and lead alloys.

SPECIAL NOTES:

Caution: The toxicological properties of this material have not been fully investigated. The information contained in this MSDS is based on information in the technical and scientific literature about the material's constituent compounds. Use appropriate procedures to prevent direct contact with the skin or eyes and to prevent ingestion or inhalation.

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredient	Approximate Percent by Weight	C.A.S. Number	Exposure Limits*		LD ₅₀ /LC ₅₀ Species and Route
Lead Sulfide	86 to 92	1314-87-0	OSHA PEL ACGIH TLV NIOSH REL	.05 mg/m ³ .05 mg/m ³ <0.1 mg/m ³	Guinea Pig-oral LDLo 10 gm/kg
Zinc Sulfide	1 to 3	1314-98-3	OSHA PEL** ACGIH TLV** NIOSH REL**	None established None established None established	Human-inh TCLo 124 mg/m ³ /50M Rat-oral LD ₅₀ >2 gm/kg Rat-inh LC ₅₀ >5040 mg/m ³ /4H Rat-skin LD ₅₀ >2gm/kg
Iron Sulfide	2 to 4	7439-89-6	OSHA PEL*** ACGIH TLV*** NIOSH REL***	None established None established None established	No data

NOTE: TLVs for individual states may differ from OSHA TLVs. Check with local authorities for the applicable state TLVs.

*OSHA - Occupational Safety and Health Administration; ACGIH - American Conference of Governmental Industrial Hygienists; NIOSH - National Institute for Occupational Safety and Health.

**The OSHA PEL for zinc oxide dust is 15 mg/m³ total and 5 mg/m³ respirable. The ACGIH TLV for zinc oxide dust is 10 mg/m³ and the NIOSH REL for zinc oxide dust is 5 mg/m³ with a STEL of 15 mg/m³.

***The OSHA PEL for iron oxide fume is 10 mg/m³. The ACGIH TLV and the NIOSH REL for iron oxide dust and fume is 5 mg/m³.

European Economic Community (EEC) Classification: Lead: Lead compounds are classified as Category 1 and Category 3 reproductive toxins and as harmful.

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LEAD CONCENTRATE

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EEC R Phrase(s): Lead Compounds: R61 - may cause harm to unborn child; R62 - possible risk of impaired fertility; R20/22 - harmful by inhalation and if swallowed; R33 - danger of cumulative effects.

Trade Names and Synonyms: Lead Concentrate

SECTION 3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance: Dark grey talc-like substance. Caution! The toxicological properties of this substance have not been fully investigated. Overexposure may cause eye, skin, digestive tract, and respiratory tract irritation. Many lead compounds can produce toxic effects in blood forming organs, kidneys and the central nervous system. May cause adverse reproductive or fetal effects. Lead compounds may cause cancer based on studies on laboratory animals. Use appropriate procedures to prevent direct contact with the skin or eyes and to prevent ingestion or inhalation.

EYE:

Eye contact may cause eye irritation.

SKIN:

Skin contact may cause skin irritation.

INHALATION:

Dust is irritating to the nose, throat, and respiratory tract. May cause effects similar to those described for ingestion. The toxicological properties of this substance have not been fully investigated.

INGESTION:

Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Many lead compounds can produce toxic effects in blood forming organs, kidneys and the central nervous system. The toxicological properties of this substance have not been fully investigated.

SIGNS AND SYMPTOM OF EXPOSURE:

Lead is a cumulative poison. When significant continuous or periodic exposure occurs, increasing amounts build up in the body and eventually symptoms and disability may occur. Some signs and symptoms of exposure to lead compounds include gastrointestinal discomfort, a blue-black line on the gums, neuromuscular dysfunction including muscle weakness and paralysis, and mental changes.

CHRONIC EFFECTS:

Many lead compounds can produce toxic effects in blood forming organs, kidneys and the central nervous system. May cause adverse reproductive or fetal effects. Lead compounds may cause cancer based on studies with laboratory animals. The toxicological properties of this substance have not been fully investigated.

REPRODUCTIVE HAZARDS:

Overexposure to lead compounds may cause adverse reproductive effects. Unborn and nursing children can be exposed to lead through their mother. This may cause premature births, smaller babies, and decreased mental ability in the infant.

CARCINOGENICITY INFORMATION:

Lead compounds may cause cancer based on studies with laboratory animals.

TARGET ORGAN:

Target Organs for lead compounds include: The central and peripheral nervous systems, blood-forming organs, kidneys, and the male reproductive system.

SECTION 4. FIRST AID MEASURES

EYE CONTACT FIRST AID:

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LEAD CONCENTRATE

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Immediately flush eyes with plenty of water for at least 15 minutes occasionally lifting the upper and lower eyelids. Get medical attention if irritation develops or persists.

SKIN CONTACT FIRST AID:

Flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing - wash before reuse. Get medical aid if irritation develops or persists.

INHALATION FIRST AID:

If exposed to excessive levels of dusts or fumes, remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if cough or other symptoms develop.

INGESTION FIRST AID:

If victim is conscious and alert, give 2 - 4 cupfuls of water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

NOTES TO PHYSICIAN:

Treat symptomatically and supportively. Chelators of choice for lead poisoning are BAL, calcium-disodium EDTA and penicillamine.

SECTION 5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

TCC Flash Point: None

Autoignition Temperature: N/A

FLAMMABLE LIMITS IN AIR

LEL: N/A

UEL: N/A

EXTINGUISHING MEDIA:

In case of fire, use water spray, dry chemical, carbon dioxide, or alcohol-resistant foam.

FIRE AND EXPLOSION HAZARDS:

During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

FIRE FIGHTING INSTRUCTIONS:

As in any fire, wear self-contained breathing apparatus pressure-demand MSHA/NIOSH (approved or equivalent) and full protective gear. Avoid breathing smoke, fumes, and decomposition products.

COMBUSTION PRODUCTS:

Excess heat will generate sulfur oxide, zinc oxide, and lead oxide fumes. Contact with acids will generate flammable and toxic hydrogen sulfide gas.

SECTION 6. ACCIDENTAL RELEASE MEASURES

SAFEGUARDS (PERSONNEL):

Use proper personal protective equipment as specified in Section 8.

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LEAD CONCENTRATE

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INITIAL CONTAINMENT

Contain spilled material

LARGE SPILLS PROCEDURE:

Contain spilled material. Clean up spilled material immediately, observing precautions in the Protective Equipment Section. Place in suitable container for recovery or disposal. Treat or dispose of waste material in accordance with all local, state/provincial, and national requirements.

SMALL SPILLS PROCEDURE:

Clean up spilled material immediately, observing precautions in the Protective Equipment Section. Place in suitable container for recovery or disposal. Treat or dispose of waste material in accordance with all local, state/provincial, and national requirements.

SECTION 7. HANDLING AND STORAGE

HANDLING

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Avoid contact with eyes, skin and clothing. Avoid ingestion and inhalation.

HANDLING (PHYSICAL ASPECTS):

Avoid excessive heat. Avoid contact with acids or oxidizers.

STORAGE PRECAUTIONS:

Store in a cool dry area. Avoid extreme temperatures. Keep away from acids and oxidizers.

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LEAD CONCENTRATE

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SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

EYE/FACE PROTECTION REQUIREMENTS:

Wear safety glasses with side shields (or goggles) and a face shield, if splashing of the material may occur. Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133.

SKIN PROTECTION REQUIREMENTS:

Wear appropriate protective gloves and clothing to prevent skin exposure.

RESPIRATORY PROTECTION REQUIREMENTS:

Follow the OSHA respirator regulations found in 29 CFR 1910.134. Always use a NIOSH approved respirator when required. Use of a NIOSH approved dust respirator is recommended when using or handling this product.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

FORMSolid, fine-grained powder
PARTICLE SIZE.....<40 um, 80% <20um
COLOR.....Dark grey
ODOR.....Weak organic odor from entrained xanthates
ODOR THRESHOLD.....None
BOILING POINT.....Not applicable (1050-2300°C in an inert atmosphere)
SOLUBILITY IN WATER.....Slight or very slight
SPECIFIC GRAVITY.....3.5 (Water = 1) in bulk
MELTING/FREEZING POINT.....Not applicable (will burn first unless in an inert atmosphere)
pH.....7.5 to 8.5
% VOLATILES.....8.1% @ 100°C
IGNITION TEMPERATURE.....Between 500-600°C (generates SO₂ and zinc, lead vapors)

SECTION 10. STABILITY AND REACTIVITY

STABILITY:

Stable under normal temperatures and pressures.

INCOMPATIBILITY WITH OTHER MATERIALS:

Reacts violently with iodine pentachloride. Incompatible with iodine monochloride, hydrogen peroxide, strong oxidizers, and strong acids. May release toxic and flammable hydrogen sulfide gas on contact with acids.

DECOMPOSITION:

This material can decompose by high temperatures forming sulfur oxides, zinc oxide, lead and lead oxide, and toxic and flammable hydrogen sulfide gas.

CONDITIONS TO AVOID:

Contact with incompatible materials (see above), excessive heat and contact with acids and oxidizers.

SECTION 11. TOXICOLOGICAL INFORMATION

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LEAD CONCENTRATE

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EYE EFFECTS:

Contact with eyes causes irritation.

SKIN EFFECTS:

Contact with skin may cause skin irritation.

ACUTE ORAL EFFECTS:

Causes gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

ACUTE INHALATION EFFECTS:

Dust is irritating to the nose, throat, and respiratory tract. May cause effects similar to those described for ingestion. The toxicological properties of this substance have not been fully investigated.

REPRODUCTIVE AND BIRTH EFFECTS:

Unborn and nursing children can be exposed to lead through their mother. This may cause premature births, smaller babies, and decreased mental ability in the infant. High levels of exposure may cause abortion and damage the male reproductive system.

CHRONIC EFFECTS:

In adults, lead exposure may decrease reaction time, possibly affect the memory, cause weakness in fingers, wrists, and ankles, increase blood pressure in middle-aged men, and cause anemia - a blood disorder.

Unborn and nursing children can be exposed to lead through their mother. This may cause premature births, smaller babies, and decreased mental ability in the infant.

GENETIC TOXICITY:

Lead compounds may have an effect on chromosomes.

SECTION 12. ECOLOGICAL INFORMATION

Lead concentrate is insoluble in water. Certain elements are known to bioaccumulate or bioconcentrate in select environmental media.

Lead: Lead compounds are highly persistent in water. Dissolved lead compounds bioaccumulate in plants and animals, both aquatic and terrestrial. In most surface water and groundwater, lead forms compounds with anions such as hydroxides, carbonates, sulfates, and phosphates and precipitates out of the water column. Lead may occur as sorbed ions or surface coatings on sediment mineral particles or may be carried in colloidal particles in surface water. Most lead is strongly retained in soil, resulting in little mobility. Lead may be immobilized by ion exchange with hydrous oxides or clays or by chelation with humic or fulvic acids in the soil.

Zinc: Zinc in the aquatic environment is adsorbed onto iron and manganese oxides, clay minerals, and organic material in sediments or suspended solids in surface waters. The mobility of zinc in soil is dependent on soil conditions, such as cation exchange capacity, pH, redox potential, and chemical species present in the soil. In general, zinc sorbs strongly to soil particulates and, unless it occurs in a soluble form such as zinc sulfate, is not highly mobile in soil. In aquatic systems, zinc bioaccumulates in both plants and animals. Zinc also bioaccumulates in terrestrial plants, vertebrates, and mammals, with plant uptake from soil dependent on the plant species, soil pH, and soil composition. In general, zinc does not biomagnify through food chains.

The mobility of metals is media dependent. Most metals will bind with organic ligands, reducing their mobility in soil and water. Mobility in air is determined by particle size.

SECTION 13. DISPOSAL CONSIDERATIONS

If material cannot be returned to process or salvage, dispose of only in accordance with applicable regulations.

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LEAD CONCENTRATE

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SECTION 14. TRANSPORT INFORMATION

PROPER SHIPPING NAME	Environmentally Hazardous Substance, Solid, n.o.s. (contains lead sulfide)
TRANSPORT CANADA HAZARD CLASS	9.2
U.S. DOT HAZARD CLASS	9
TRANSPORT CANADA AND U.S. DOT PRODUCT IDENTIFICATION NUMBER	UN3077
MARINE POLLUTANT	No
IMO CLASSIFICATION	MHB (Materials Hazardous Only in Bulk)

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LEAD CONCENTRATE

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SECTION 15. REGULATORY INFORMATION

U.S.

HAZARDOUS UNDER HAZARD COMMUNICATION STANDARD:

Lead Sulfide Y

INGREDIENTS LISTED ON TSCA INVENTORY

Y

CERCLA SECTION 103 HAZARDOUS SUBSTANCES

Lead Sulfide	Y	RQ: 10 pounds
Zinc Compounds	Y	RQ: None assigned

EPCRA SECTION 302 EXTREMELY HAZARDOUS SUBSTANCE

None of the ingredients qualify

EPCRA SECTION 311/312 HAZARD CATEGORIES

Delayed (Chronic) Health Hazard - Carcinogen

EPCRA SECTION 313 TOXIC RELEASE INVENTORY

Lead Compounds	Percent by Weight: 60 to 70
Zinc Compounds	Percent by Weight: 14 to 21

CALIFORNIA PROPOSITION 65:

Lead compounds are chemicals known to the State of California to cause cancer and reproductive toxicity.

CANADIAN:

WHMIS CLASSIFICATION:

Controlled Product, Classification D2A
This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

SECTION 16. OTHER INFORMATION

The information in this Material Safety Data Sheet is based on the following references:

American Conference of Governmental Industrial Hygienists, 1991, Documentation of the Threshold Limit Values and Biological Exposure Indices, Sixth Edition (Lead Revision 1995).

American Conference of Governmental Industrial Hygienists, 1996, Guide to Occupational Exposure Values.

American Conference of Governmental Industrial Hygienists, 1996, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices - 1995-1996.

Clayton and Clayton, 1994, Patty's Industrial Hygiene and Toxicology, Fourth Edition.

European Economic Community, Commission Directives 91/155/EEC and 67/548/EEC.

Lewis, Richard J., Sr., 1991, Hazardous Chemicals Desk Reference, Second Edition.

Industry Canada, SOR/88-66, as amended, Controlled Products Regulations.

Merck & Co., Inc., 1989, The Merck Index, An Encyclopedia of Chemicals, Drugs, and Biologicals, Eleventh Edition.

National Library of Medicine, National Toxicology Information Program, 1996, Hazardous Substance Data Bank.

Principles of Clinical Toxicology, 1994

Sax, N. Irving, 1984, Dangerous Properties of Industrial Materials, Sixth Edition.

U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, 1993, Toxicological Profile for Lead.

U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, 1995, Update Toxicological Profile for Silica.

U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, 1994, Update Toxicological Profile for Zinc.

U.S. Environmental Protection Agency, Online Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, 1996, Integrated Risk Information System.

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LEAD CONCENTRATE

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U.S. Occupational Safety and Health Administration, 1989, Code of Federal Regulations, Title 29, Part 1910.

Notice to Reader

Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. Teck Cominco Metals Ltd. extends no warranty and assumes no responsibility for the accuracy of the content and expressly disclaims all liability for reliance thereon. This material safety data sheet provides guidelines for the safe handling and processing of this product; it does not and cannot advise on all possible situations, therefore, your specific use of this product should be evaluated to determine if additional precautions are required. Individuals exposed to this product should read and understand this information and be provided pertinent training prior to working with this product.

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LUBRICATING OIL; PETROLEUM OIL

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

***** IDENTIFICATION *****

MSDS RECORD NUMBER : 2313142

PRODUCT NAME(S) : TRANSCAL-N

PRODUCT IDENTIFICATION : LUBRICATING OIL; PETROLEUM OIL

MSDS No. 0135104 US/ENGLISH

CAS NUMBER: 64742-65-0

DATE OF MSDS : 1999-12-09

CURRENCY NOTE : This MSDS was provided to CCOHS in

electronic form on 2000-05-31

***** MANUFACTURER INFORMATION *****

MANUFACTURER : BP Marine America's

ADDRESS : Post Office Box 4518

Houston Texas

U.S.A. 77210-4518

Telephone: 630-434-6377 (OTHER PRODUCT

SAFETY INFORMATION, USA)

EMERGENCY TELEPHONE NO. : 800-447-8735 (HEALTH INFORMATION)

613-996-6666 (SPILL INFORMATION, CANUTEC,

Canada)

***** MATERIAL SAFETY DATA *****

MSDS No. 0135104 US/ENGLISH

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER/SUPPLIER:	EMERGENCY HEALTH INFORMATION:
BP Marine America's	1 (800) 447-8735
PO Box 4518	
Houston, TX 77210-4518 U.S.A.	EMERGENCY SPILL INFORMATION:
	1 (800) 424-9300 CHEMTREC (USA)
	OTHER PRODUCT SAFETY INFORMATION:
	1 (630) 434-6377 (USA)

SUBSTANCE: TRANSCAL-N

TRADE NAMES/SYNONYMS: LUBRICATING OIL; PETROLEUM OIL

CREATION DATE: Dec 09 1999

REVISION DATE: Dec 21 1999

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LUBRICATING OIL; PETROLEUM OIL

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SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: SOLVENT-DEWAXED HEAVY PARAFFINIC DISTILLATE
CAS NUMBER: 64742-65-0
EC NUMBER (EINECS): 265-169-7
PERCENTAGE: <100

COMPONENT: HYDROTREATED HEAVY PARAFFINIC DISTILLATE
CAS NUMBER: 64742-54-7
EC NUMBER (EINECS): 265-157-1
PERCENTAGE: <100

(See Section 8, "Exposure Controls, Personal Protection", for exposure guidelines)

SECTION 3 HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=1 REACTIVITY=0

EMERGENCY OVERVIEW:

COLOR: yellow
PHYSICAL FORM: liquid
ODOR: hydrocarbon odor
MAJOR HEALTH HAZARDS: Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.

POTENTIAL HEALTH EFFECTS:

INHALATION:
No significant health hazards identified.
SKIN CONTACT:
Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis. Heated material can cause thermal burns.
EYE CONTACT:
No significant health hazards identified.
INGESTION:
Ingestion causes gastrointestinal irritation and diarrhea.

SECTION 4 FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Get medical attention.

SKIN CONTACT: Wash exposed skin with soap and water. Remove contaminated clothing and thoroughly clean and dry before reuse. Get medical attention if irritation develops.

EYE CONTACT: Flush eyes with plenty of water.

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LUBRICATING OIL; PETROLEUM OIL

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INGESTION: If swallowed, drink plenty of water. Get immediate medical attention. Induce vomiting only at the instructions of a physician. Do not give anything by mouth to unconscious or convulsive person.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Slight fire hazard.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical, regular foam, water

FIRE FIGHTING: Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Water or foam may cause frothing.

FIRE FIGHTING PROTECTIVE EQUIPMENT: Firefighters should wear full bunker gear, including a positive pressure self contained breathing apparatus.

FLASH POINT: 410 F (210 C)

FLAMMABILITY CLASSIFICATION: Not Flammable.

HAZARDOUS COMBUSTION PRODUCTS:

Thermal decomposition products or combustion: hydrocarbons, oxides of carbon

SECTION 6 ACCIDENTAL RELEASE MEASURES

Stop leak if possible without personal risk. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal. Cover with plastic sheet or tarp to minimize spreading and protect from contact with water. Prevent spreading by diking, ditching, or absorbing on inert materials.

SECTION 7 HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Do not store in unlabeled containers. Keep away from heat, sparks and flame. Store in a cool, dry place. Store in a well-ventilated area. Keep container tightly closed. Keep separated from incompatible substances.

HANDLING: Keep away from all ignition sources. Use only with adequate ventilation. Do not eat, drink or smoke in areas of use or storage. Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet facilities. Remove contaminated clothing and thoroughly clean and dry before reuse. Wash thoroughly after work using soap and water.

SPECIAL PRECAUTIONS: Empty containers may contain toxic,

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LUBRICATING OIL; PETROLEUM OIL

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flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld, reuse or dispose of containers unless adequate precautions are taken against these hazards.

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

SOLVENT-DEWAXED HEAVY PARAFFINIC DISTILLATE:

MINERAL OIL MIST:

5 mg/m3 OSHA TWA

5 mg/m3 ACGIH TWA (Notice of Intended Changes 1993-1994)

10 mg/m3 ACGIH STEL (Notice of Intended Changes 1993-1994)

5 mg/m3 MEXICO TWA

10 mg/m3 MEXICO STEL

HYDROTREATED HEAVY PARAFFINIC DISTILLATE:

MINERAL OIL MIST:

5 mg/m3 OSHA TWA

5 mg/m3 ACGIH TWA (Notice of Intended Changes 1993-1994)

10 mg/m3 ACGIH STEL (Notice of Intended Changes 1993-1994)

5 mg/m3 MEXICO TWA

10 mg/m3 MEXICO STEL

VENTILATION: Use with adequate ventilation. Control airborne concentrations below the exposure guidelines.

EYE PROTECTION: None required; however, use of eye protection is good industrial practice.

CLOTHING: Avoid repeated or prolonged contact. Wear protective clothing if prolonged or repeated contact is likely.

GLOVES: Wear protective gloves if prolonged or repeated contact is likely.

RESPIRATOR: Use with adequate ventilation.

Avoid breathing vapor or mist.

If ventilation is inadequate, use a NIOSH certified respirator with an organic vapor cartridge and P95 particulate filter.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid

APPEARANCE: clear

COLOR: yellow

ODOR: hydrocarbon odor

BOILING POINT: 649 F (343 C)

FREEZING POINT: Not available

POUR POINT: 10.0 F (-12.2 C)

VAPOR PRESSURE: <0.1 mmHg @ 38 C

VAPOR DENSITY (air=1): >1

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LUBRICATING OIL; PETROLEUM OIL

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SPECIFIC GRAVITY (water=1): 0.873
WATER SOLUBILITY: almost insoluble
PH: Not available
VOLATILITY: negligible
ODOR THRESHOLD: Not available
EVAPORATION RATE: very slow, water=1
VISCOSITY: 150-160 SUS @ 38 C
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Avoid contact with incompatible materials.

INCOMPATIBILITIES: strong oxidizing materials

HAZARDOUS DECOMPOSITION:

Thermal decomposition products or combustion: hydrocarbons, oxides of carbon

POLYMERIZATION: Will not polymerize.

SECTION 11 TOXICOLOGICAL INFORMATION

EYE IRRITATION: Testing not conducted. See Other Toxicity Data.

SKIN IRRITATION: Testing not conducted. See Other Toxicity Data.

DERMAL LD50: Testing not conducted. See Other Toxicity Data.

ORAL LD50: Testing not conducted. See Other Toxicity Data.

INHALATION LC50: Testing not conducted. See Other Toxicity Data.

OTHER TOXICITY DATA:

Specific toxicity tests have not been conducted on this product. Our hazard evaluation is based on information from similar products, the ingredients, technical literature, and/or professional experience.

No component of this product present at levels greater than 0.1% is identified as a carcinogen by the U.S. National Toxicology Program, the U.S. Occupational Safety and Health Act, or the International Agency for Research on Cancer (IARC).

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LUBRICATING OIL; PETROLEUM OIL

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SECTION 12 ECOLOGICAL INFORMATION

Ecological testing has not been conducted on this product by BP Amoco.

SECTION 13 DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

SECTION 14 TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION: Not regulated.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS: Not regulated.

LAND TRANSPORT ADR/RID: Not regulated.

AIR TRANSPORT IATA/ICAO: Not regulated.

MARITIME TRANSPORT IMDG: Not regulated.

SECTION 15 REGULATORY INFORMATION

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR Part 302.4): This product is not reportable under 40 CFR Part 302.4.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR Part 355): This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA TITLE III SECTION 311/312 HAZARDOUS CATEGORIZATION (40 CFR Part 370):

ACUTE: N

CHRONIC: N

FIRE: N

REACTIVE: N

SUDDEN RELEASE: N

SARA TITLE III SECTION 313 (40 CFR Part 372): This product is not regulated under Section 313 of SARA and 40 CFR Part 372.

STATE REGULATIONS:

California Proposition 65: N

TSCA INVENTORY STATUS: Listed on inventory.

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LUBRICATING OIL; PETROLEUM OIL

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OSHA HAZARD COMMUNICATION STANDARD: Contains a component listed by ACGIH.
Contains a component listed by OSHA.

EC INVENTORY (EINECS/ELINCS): In compliance.

JAPAN INVENTORY (MITI): Not determined.

AUSTRALIA INVENTORY (AICS): Not determined.

KOREA INVENTORY (ECL): Not determined.

CANADA INVENTORY (DSL): Listed on inventory.

PHILIPPINE INVENTORY (PICCS): Not determined.

CHINA INVENTORY (IECS): Not determined.

SECTION 16 OTHER INFORMATION

Prepared by: Product Stewardship and Toxicology

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This Material Safety Data Sheet conforms to the requirements of ANSI Z400.1.
NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practice

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MIBC (METHYL ISOBUTYL CARBINOL)

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2427908

PRODUCT NAME(S) : METHYL ISOBUTYL CARBINOL

DATE OF MSDS : 2000-02-02

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-09-27

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : CANADA COLORS AND CHEMICALS LIMITED

ADDRESS : 80 Scarsdale Road
Don Mills Ontario
Canada M3B 2R7
Telephone: 416-449-7750

EMERGENCY TELEPHONE NO. : 416-444-2112

SUPPLIER/DISTRIBUTOR NOTE :

For further information about this product please contact the Canada
Colors Customer Service Department at 416-449-7750.

*** MATERIAL SAFETY DATA ***

MATERIAL SAFETY DATA SHEET : 00000545

CANADA COLORS AND CHEMICALS LI
80 SCARSDALE ROAD
DON MILLS, ONTARIO M3B 2R7
(416) 449-7750

Product: METHYL ISOBUTYL CARBINOL

SECTION 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER..... CANADA COLORS & CHEMICALS LTD.
80 SCARSDALE ROAD,
DON MILLS, ON

M3B 2R7

PRODUCT NAME.....

PRODUCT CODE.....

CHEMICAL FORMULA..... C6H14O.

MOLECULAR WEIGHT..... N.AV.

CHEMICAL FAMILY..... ORGANIC.

MATERIAL USE..... SOLVENT.

EMERGENCY PHONE NO..... (416)-444-2112.

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MIBC (METHYL ISOBUTYL CARBINOL)

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SECTION 02: COMPOSITION/INFORMATION ON INGREDIENTS

%	CAS / TLV	LD/50, ROUTE, SPECIES	LC/50, ROUTE, SPECIES
METHYL ISOBUTYL CARBINOL			
100	108-11-2	>2590 MG/KG	>2000 PPM/8H
	25 PPM SKIN		

SECTION 03: HAZARDS IDENTIFICATION

ROUTE OF ENTRY:.....

SKIN CONTACT..... BRIEF CONTACT MAY CAUSE SLIGHT IRRITATION WITH ITCHING AND LOCAL REDNESS. PROLONGED OR REPEATED CONTACT MAY CAUSE DEFATTING AND DRYING OF THE SKIN.

SKIN ABSORPTION..... PROLONGED OR WIDESPREAD CONTACT MAY RESULT IN THE ABSORPTION OF POTENTIALLY HARMFUL AMOUNTS OF MATERIAL.

EYE CONTACT..... EXCESS REDNESS AND SWELLING OF THE CONJUNCTIVA MAY OCCUR.CAUSES IRRITATION, EXPERIENCED AS STINGING AND DISCOMFORT OR PAIN.CORNEAL INJURY MAY OCCUR.

INHALATION..... HIGH CONCENTRATIONS OF VAPOUR MAY CAUSE IRRITATION OF THE RESPIRATORY TRACT, EXPERIENCED AS NASAL DISCOMFORT AND DISCHARGE, WITH CHEST PAIN AND COUGHING. HIGH VAPOUR CONCENTRATIONS MAY CAUSE DROWSINESS AND HEADACHE.

INGESTION..... MODERATELY TOXIC.HEADACHE, DIZZINESS, DROWSINESS, NAUSEA, VOMITING MAY OCCUR.

EFFECTS OF ACUTE EXPOSURE..... SEE ABOVE.

EFFECTS OF CHRONIC EXPOSURE..... NO ADVERSE EFFECTS ANTICIPATED FROM AVAILABLE INFORMATION.

MEDICAL CONDITIONS AGGRAVATED..... SKIN CONTACT MAY AGGRAVATE AN EXISTING BY OVEREXPOSURE DERMATITIS.

SECTION 04: FIRST AID MEASURES

INSTRUCTIONS:..... EYE CONTACT:. FLUSH EYES WITH LARGE AMOUNTS OF RUNNING WATER FOR AT LEAST 15 MINUTES. HOLD EYELIDS APART TO ENSURE RINSING OF THE ENTIRE SURFACE OF THE EYE AND LIDS WITH WATER.REMOVE ANY CONTACT LENSES.GET IMMEDIATE MEDICAL ATTENTION.IN CASE OF SKIN CONTACT.START RINSING AND REMOVE CONTAMINATED CLOTHING WHILE RINSING.WASH SKIN WITH SOAP AND WATER.WASH CLOTHING BEFORE REUSE.IF IRRITATION PERSISTS, GET MEDICAL ATTENTION.IN CASE OF

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MIBC (METHYL ISOBUTYL CARBINOL)

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INGESTION, GIVE LARGE QUANTITIES OF WATER IF CONSCIOUS. INDUCE VOMITING. THIS SHOULD BE DONE ONLY BY MEDICAL OR EXPERIENCED FIRST-AID PERSONEL. GET IMMEDIATE MEDICAL ATTENTION. IF INHALED, REMOVE FROM AREA TO FRESH AIR. APPLY ARTIFICIAL RESPIRATION OR ADMINISTER OXYGEN, IF NECESSARY. OXYGEN MAY BE GIVEN BY QUALIFIED PERSONNEL. SEEK MEDICAL ATTENTION.

NOTES TO PHYSICIAN:..... THERE IS NO SPECIFIC ANTIDOTE. TREATMENT SHOULD BE DIRECTED AT THE CONTROL OF SYMPTOMS AND THE CLINICAL CONDITION OF THE PATIENT.

SECTION 05: FIRE FIGHTING MEASURES

T.D.G. FLAM. CLASS..... 3.
FLAMMABILITY..... YES.
IF YES, UNDER WHICH.....
CONDITIONS?
EXTINGUISHING MEDIA..... USE WATER SPRAY (FOG), ALCOHOL-TYPE OR ALL-PURPOSE-TYPE FOAM BY MANUFACTURERS' RECOMMENDED TECHNIQUES FOR LARGE FIRES. USE CARBON DIOXIDE OR DRY CHEMICAL FOR SMALL FIRES.
SPECIAL PROCEDURES..... FLAMMABLE. WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING.
FLASH POINT (C), METHOD..... 39 (C). (T.C.C.). ASTM D 56. 41. (T.O.C.). ASTM D 1310.
AUTO IGNITION TEMPERATURE..... N.AV.
UPPER FLAMMABLE LIMIT (% BY..... 5.5.
VOL.)
LOWER FLAMMABLE LIMIT (% BY..... 1.0.
VOL.)
EXPLOSION DATA.....
EXPLOSIVE POWER..... N.AV.
RATE OF BURNING..... N.AV.
UNUSUAL FIRE AND EXPLOSION..... THIS MATERIAL MAY PRODUCE A FLOATING FIRE HAZARD IN EXTREME FIRE CONDITIONS.
HAZARDS
HAZARDOUS COMBUSTION PRODUCTS..... BURNING CAN PRODUCE, . CARBON DIOXIDE, CARBON MONOXIDE. CARBON MONOXIDE IS HIGHLY TOXIC IF INHALED; CARBON DIOXIDE IN SUFFICIENT CONCENTRATIONS CAN ACT AS AN ASPHYXIAN.

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MIBC (METHYL ISOBUTYL CARBINOL)

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SECTION 06: ACCIDENTAL RELEASE MEASURES

LEAK/SPILL..... SMALL SPILLS CAN BE FLUSHED WITH LARGE
QUANTITIES OF WATER.LARGE SPILLS SHOULD BE
COLLECTED FOR DISPOSAL.AVOID CONTACT WITH
LIQUID AND VAPOURS.WEAR PROTECTIVE
EQUIPMENT.THIS PRODUCT MAY BE TOXIC TO
FISH. AVOID DISCHARGE TO NATURAL WATERS.

SECTION 07: HANDLING AND STORAGE

HANDLING PROCEDURES AND..... AVOID CONTACT WITH EYES.AVOID
EQUIPMENT INGESTION.AVOID INHALING.WEAR PROTECTIVE
EQUIPMENT DURING HANDLING.KEEP AWAY FROM
HEAT AND FLAMES.VAPOURS MAY ACCUMULATE AND
TRAVEL TO DISTANT IGNITION SOURCES AND
FLASHBACK.KEEP CONTAINER CLOSED.EMPTY
CONTAINERS ARE HAZARDOUS, MAY CONTAIN
FLAMMABLE/EXPLOSIVE DUSTS, LIQUID RESIDUE
OR VAPOURS.FOLLOW LABELED WARNINGS EVEN
AFTER CONTAINER IS EMPTIED.USE ADEQUATE
VENTILATION.WASH THOROUGHLY AFTER
HANDLING.MAINTAIN A GOOD PERSONAL HYGIENE.
STORAGE NEEDS..... STORE IN A COOL, DRY, WELL VENTILATED
AREA, AWAY FROM HEAT AND IGNITION SOURCES.

SECTION 08: EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE GUIDELINES:..... COMPONENT:. METHYL ISOBUTYL CARBINOL:. 104
MG/M3 TWA8 ACGIH. 25 PPM TWA8 ACGIH. 167
MG/M3 STEL ACGIH. 40 PPM STEL ACGIH.
GLOVES/ TYPE..... IMPERVIOUS GLOVES (NEOPRENE).
RESPIRATORY/TYPE..... USE SELF CONTAINED BREATHING APPARATUS IN
HIGH VAPOUR CONCENTRATIONS.
EYE/TYPE..... MONOGOGGLES. OR. FACE SHIELD.
FOOTWEAR/TYPE..... NO SPECIAL REQUIREMENTS.
CLOTHING/TYPE..... WEAR IMPERVIOUS PROTECTIVE CLOTHING.
CHEMICAL APRON.
OTHER/TYPE..... EYE BATH AND SAFETY SHOWER.
ENGINEERING CONTROLS..... GENERAL (MECHANICAL) ROOM VENTILATION IS

EXPECTED TO BE SATISFACTORY WHERE THIS
PRODUCT IS STORED AND HANDLED IN CLOSED
EQUIPMENT.SPECIAL, LOCAL VENTILATION IS
NEEDED AT POINTS WHERE VAPOURS CAN BE
EXPECTED TO ESCAPE TO THE WORKPLACE
AIR.PROCESS HAZARD:. SUDDEN RELEASE OF HOT
ORGANIC CHEMICAL VAPORS OR MISTS FROM
PROCESS EQUIPMENT OPERATING AT ELEVATED

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MIBC (METHYL ISOBUTYL CARBINOL)

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TEMPERATURE AND PRESSURE, OR SUDDEN
INGRESS OF AIR INTO HOT EQUIPMENT UNDER A
VACUUM, MAY RESULT IN IGNITIONS WITHOUT
THE PRESENCE OF OBVIOUS IGNITION
SOURCES. PUBLISHED "AUTOIGNITION" OR
"IGNITION" TEMPERATURE VALUES CANNOT BE
TREATED AS SAFE OPERATING TEMPERATURES IN
CHEMICAL PROCESSES WITHOUT ANALYSIS OF THE
ACTUAL PROCESS CONDITIONS. ANY USE OF THIS
PRODUCT IN ELEVATED-TEMPERATURE PROCESS
SHOULD BE THOROUGHLY EVALUATED TO
ESTABLISH AND MAINTAIN SAFE OPERATING
CONDITIONS.

SECTION 09: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE..... LIQUID. TRANSPARENT COLOURLESS.
ODOUR..... MILD NONRESIDUAL.
ODOUR THRESHOLD..... N.AV.
VAPOUR PRESSURE (MMHG)..... 0.49 KPA. 3.7 MMHG.
VAPOUR DENSITY (AIR=1)..... 3.5.
EVAPORATION RATE..... 0.43.
BOILING POINT..... 131.7 (C).
FREEZING POINT..... -90.
PH..... N.AV.
SPECIFIC GRAVITY (WATER=1)..... 0.8075.
SOLUBILITY IN WATER (% W/W)..... 1.7. AT 20 (C).
MOLECULAR WEIGHT..... 102.18 G/MOL.
VOLATILE..... 100%.
COEFFICIENT OF WATER/OIL DIST..... N.AV.

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY:.....
 YES..... YES.
 NO, WHICH CONDITIONS?.....
COMPATABILITY WITH OTHER.....
SUBSTANCES:
 YES.....
 NO, WHICH ONES?..... STRONG ACIDS. STRONG ALKALIES.
REACTIVITY CONDITIONS?..... AVOID EXCESSIVE HEAT, OPEN FLAMES AND ALL
 IGNITION SOURCES.
HAZARDOUS PRODUCTS OF..... CARBON MONOXIDE AND CARBON DIOXIDE ARE
DECOMPOSITION..... PRODUCED ON COMBUSTION.
HAZARDOUS POLYMERIZATION..... WILL NOT OCCUR.

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MIBC (METHYL ISOBUTYL CARBINOL)

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SECTION 11: TOXICOLOGICAL INFORMATION

EXPOSURE LIMIT OF MATERIAL..... SEE SECTION 02.
LC 50 OF MATERIAL, SPECIES &..... SEE SECTION 02.
ROUTE
LD 50 OF MATERIAL, SPECIES &..... COMPONENT: METHYLISOBUTYLCARBINOL. 2590
ROUTE MG/KG. (RAT). 3560 ML/KG. (RABBIT).
CARCINOGENICITY OF MATERIAL..... NONE.
REPRODUCTIVE EFFECTS..... NONE.
IRRITANCY OF MATERIAL..... SEE SECTION 03.
SENSITIZING CAPABILITY OF..... NONE.
MATERIAL
SYNERGISTIC MATERIALS..... NONE.

SECTION 12: ECOLOGICAL CONSIDERATIONS

ENVIRONMENTAL TOXICITY..... AT VERY LOW CONCENTRATION IN WATER, THIS
INFORMATION PRODUCT IS BIODEGRADABLE IN A BIOLOGICAL
WASTEWATER TREATMENT PLANT. THIS PRODUCT
MAY BE TOXIC TO FISH. AVOID DISCHARGE TO
NATURAL WATERS.

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL..... INCINERATE IN A FURNACE IN RESPECT TO
PROVINCIAL, FEDERAL AND MUNICIPAL
REGULATIONS.

SECTION 14: TRANSPORT INFORMATION

UN NUMBER..... 2053.
TDG CLASSIFICATION..... 3.
PACKING GROUP..... III.
SPECIAL SHIPPING INSTRUCTIONS..... NOT REGULATED IF <454 L.

SECTION 15: REGULATORY INFORMATION

WHMIS CLASSIFICATION..... B3. D2B.
CPR COMPLIANCE..... THIS PRODUCT HAS BEEN CLASSIFIED IN
ACCORDANCE WITH THE HAZARD CRITERIA OF THE
CPR AND THE MSDS CONTAINS ALL THE
INFORMATION REQUIRED BY THE CPR.

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MIBC (METHYL ISOBUTYL CARBINOL)

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SECTION 16: OTHER INFORMATION

N.AV.=NOT AVAILABLE.....

N.AP.=NOT APPLICABLE.....

PREPARED BY..... Regulatory Affairs

DATED..... 02022000

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MOTOR OIL

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2006368

PRODUCT NAME(S) : MOTOR OIL - ALL GRADES

PRODUCT IDENTIFICATION : MSDS NUMBER 3700A

DATE OF MSDS : 1998-06-10

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 1999-02-01

*** MANUFACTURER INFORMATION ***

MANUFACTURER : PRODUITS LUBRI-DELTA INC

ADDRESS : 2215 boulevard Industriel
Chomedey Laval Quebec
Canada H7S 1P8
Telephone: 450-629-4555 514-383-2784
Fax: 514-383-4241

EMERGENCY TELEPHONE NO. : 613-996-6666 (CANUTEC)

*** MATERIAL SAFETY DATA ***

PRODUITS LUBRI-DELTA INC.
2215, boulevard Industriel
Chomedey, Laval QC H7S 1P8

(450) 629-4555 (514) 383-2784 FAX (514) 383-4241

MATERIAL SAFETY DATA SHEET

PREPARATION INFORMATION

PERSON IN CHARGE	LAURENT MILLETTE
TELEPHONE NUMBER	(450) 629-4555
REVISED ON	June 10, 1998
MSDS NUMBER	3700A

MATERIAL IDENTIFICATION	MOTOR OIL - ALL GRADES
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EMERGENCY CANADIAN CENTER	CANUTEC
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(613) 996-6666

THIS PRODUCT IS NOT REGULATED BY W.H.M.I.S.

DANGEROUS GOODS	none
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TRANSPORT CLASSIFICATIONS	none
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MOTOR OIL

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PHYSICAL DATA

APPEARANCE & ODOUR	liquid with characteristic odour
ODOUR LIMIT (ppm)	100
VAPOUR PRESSURE (mmHg 20 deg C)	>1
EVAPORATION RATE (butyl acetate = 1)	<1
pH	-----
DENSITY	0.86 to 0.92
VAPOUR DENSITY (air = 1)	>1
BOILING POINT deg C	170 to 350
FREEZING POINT deg C	-40 to 0
SOLUBILITY IN WATER/OIL	insoluble in water

FIRE & EXPLOSION DATA

INFLAMMABILITY CONDITIONS	none
EXTINGUISHING MEDIA	dry chemical products, foam, waterspray
FLASH POINT (open vase)	minimum 190 deg C
UPPER FLAMMABLE LIMIT %/VOLUME	not available
LOWER FLAMMABLE LIMIT %/VOLUME	not available
AUTO IGNITION TEMPERATURE	>220 deg C
DANGEROUS COMBUSTION PRODUCTS	thermal decomposition may produce carbon oxyde, nitrogen,
SHOCK EXPLOSIBILITY	phosphorous
ELECTRO-STATICS	none
	none

REACTIVITY

INSTABILITY CONDITIONS	stable
MATERIAL TO AVOID	all oxidizing and comburant products
CONDITIONS TO AVOID	high temperature
HAZARDOUS DECOMPOSITION PRODUCTS	carbon oxyde, nitrogen,
phosphorous, sulfur	

HEALTH HAZARD INFORMATION

SKIN CONTACT	prolonged or repeated contact
can cause dermatitis	
SKIN ABSORPTION	very low toxicity
EYE CONTACT	mild to severe irritation if not washed off rapidly
INHALATION	not considered as a risk at room temperature, low toxicity
ACUTE EXPOSITION EFFECTS	nothing serious
EXPOSITION LIMIT (ppm)	moderate, 8 hours (5 mg/m3)
IRRITATING PROPERTY	no
SENSIBILITY TO PRODUCT	none
CANCEROGENICITY	none
TOXIC EFFECTS ON REPRODUCTION	none
TERATOGENICITY	no
MUTAGENICITY	no
SYNERGETIC TOXICOLOGIC PRODUCTS	none

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MOTOR OIL

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PREVENTIVE MEASURES

PERSONAL MATERIAL TO USE	rubber gloves
SPECIAL TECHNIQUES TO USE	none
STEPS TO BE TAKEN IF MATERIAL IS RECASED chemically inert products OR SPILLED	absorb with porus and
ELIMINATION OF RESIDUALS	according to local rules
METHODS AND EQUIPMENTS FOR MANUTENTION measures to observe	normal uses and security
SHIPPING INSTRUCTIONS	none

EMERGENCY AND FIRST-AID PROCEDURES

EYES	copious water flush - 15 minutes
SKIN	soap and water flush
INHALATION	not applicable
INGESTION	DO NOT INDUCE VOMITING, call a physician
EMERGENCY 5060	QUEBEC ANTI-POISON CENTER AT 1-800-463-

The informations contained in this document are given as a guide for the product manutention and were written in good faith by competent technical personnel. These informations should not be considered as complete because other aspects of manutention and uses could be observed. In no case, Produits Lubri-Delta Inc. could be held responsible for damages, losts and injuries resulting of the use of this product and no warranty whatsoever, tacit or express is awarded by Produits Lubri-Delta Inc. This material safety data sheet is in effect for three (3) years.

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NITROGEN

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 950152

PRODUCT NAME(S) : Nitrogen

PRODUCT IDENTIFICATION : CAS No.: 7727-37-9

Form No. F-85313-4

DATE OF MSDS : 1992-10-01

*** MANUFACTURER INFORMATION ***

MANUFACTURER : ANSUL INCORPORATED

ADDRESS : One Stanton Street

Marinette Wisconsin

U.S.A. 54143-2542

Telephone: 715-735-7411 (Other

Information Calls)

EMERGENCY TELEPHONE NO. : 800-424-9300 (CHEMTREC)

*** MATERIAL SAFETY DATA ***

MATERIAL SAFETY DATA SHEET

NITROGEN

QUICK IDENTIFIER (In Plant Common Name)

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Prepared By: Safety and Health Department

Date Prepared: October 1, 1992

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SECTION 1 - IDENTITY

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Common Name: (used on label) Nitrogen

(Trade Name and Synonyms)

CAS No.: 7727-37-9

Chemical Nitrogen Chemical Gas

Name: Family:

Formula: N2

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NITROGEN

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SECTION 2 - INGREDIENTS

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PART A - HAZARDOUS INGREDIENTS

Principal Hazardous Component(s)
(chemical and common name(s)):

%

CAS No.

Nitrogen

100

7727-37-9

ACGIH TLV: N/A

Acute Toxicity Data: NDA

PART B - OTHER INGREDIENTS

Other Component(s)
(chemical and common name(s)):

%

CAS No.

None

N/A

N/A

Acute Toxicity Data: N/A

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SECTION 3 - PHYSICAL AND CHEMICAL CHARACTERISTICS

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(Fire and Explosion Data)

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Boiling Point: - 195.8 deg C

Specific Gravity (H2O=1): N/A

Vapor Pressure (mm Hg): N/A

Percent Volatile by Volume (%): 100

Vapor Density (Air = 1): 0.98

Evaporation Rate (= 1): N/A - Gas at room temperature.

Solubility in Water: Slight

Reactivity in Water: Slight-forms H2CO3

Appearance and Odor: Colorless gas, with no odor.

Flash Point: None

Flammable Limits in Air % by Volume: N/A

Extinguisher Media: N/A

Auto-Ignition Temperature: N/A

Special Fire Fighting Procedures: Though gas cylinders are equipped with pressure and temperature relief devices, they should be removed from high temperatures or fire to avoid risk of rupture.

Unusual Fire and Explosion Hazards: None

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NITROGEN

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SECTION 4 - PHYSICAL HAZARDS

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Stability: Unstable [] Conditions N/A
 Stable [X] to Avoid:

Incompatibility Can react violently with Li, Nd, Ti under proper
(Materials to Avoid): conditions.

Hazardous None
Decomposition Products:

Hazardous May Occur [] Conditions N/A
Polymerization: Will Not Occur [X] to Avoid:

NOTE: As used in Ansul extinguishers or cylinders, N2 is a gas compressed under pressure up to 2400 psi at 70 deg F.

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SECTION 5 - HEALTH HAZARDS

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Threshold None Listed
Limit Value:

Routes of Entry:

Eye Contact: Avoid contact with liquefied form of N2. Can produce
 chilling sensations and discomfort, also frostbite.
Skin Contact: Evaporation of liquid from the skin can produce chilling
 sensations. Frostbite can occur. Avoid N2 liquid.
Inhalation: In high concentrations, it is a simple asphyxiant -
 dizziness, shortness of breath, unconsciousness, or
 suffocation may occur.
Ingestion: Ingestion is not likely to occur since this material is
 gas at room temperature.

Signs and Symptoms:

Acute Overexposure: Dizziness, headaches, tinnitus, difficulty
 breathing, drowsiness, depending on length of
 exposure and concentrations.
Chronic Overexposure: Compressed air illness.

Medical Conditions Generally None known.
Aggravated by Exposure:

Chemical Listed as Carcinogen or Potential:

National Toxicology Yes [] I.A.R.C. Yes [] OSHA: Yes []
Program: No [X] Monographs: No [X] No [X]

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NITROGEN

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SECTION 6 - EMERGENCY AND FIRST AID PROCEDURES

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Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes while holding lids open. If redness, itching or a burning sensation develops, get Medical attention. Treat for frostbite if necessary.

Skin Contact: Wash the material off the skin with copious amounts of soap and water for at least 15 minutes. If redness, itching, or burning sensation develops, get Medical attention. Treat for frostbite if necessary.

Inhalation: Remove victim to fresh air. If cough or other respiratory symptoms occur, consult medical personnel. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Consult Medical personnel.

Ingestion: Ingestion is not likely to occur since this material is gas at room temperature.

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SECTION 7 - SPECIAL PROTECTION INFORMATION

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Respiratory Protection (Specify Type): Not normally necessary if controls are adequate. If exposure is prolonged, a self-contained breathing apparatus is recommended.

Ventilation:	Local Exhaust:	Mechanical (General):
	Recommended in confined spaces.	Recommended
Protective For contact with liquid.	Eye	Chemical goggles
Gloves:	Protection:	recommended when handling liquid. Full faceshield in addition if splashing is possible.
Other Protective Clothing or Equipment:	Protective clothing for contact with liquid.	

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SECTION 8 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

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Precautions to be Taken in Handling and Storage:	Store containers in a clean, dry well-ventilated area, away from heat above 125 deg F. Store as a compressed gas in DOT approved vessels. If cylinder is not attached to a system, it must be safety capped to protect against violent vessel movement or force of escaping gas if valve is actuated or seal is accidentally punctured.
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NITROGEN

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Other	Note incompatibility information in Section
Precautions:	4.
Steps to be Taken in Case	Ventilate to outside.
Material is Released or Spilled:	
Waste Disposal	Dispose of in compliance with local, state,
Methods:	and federal regulations.

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HAZARDOUS MATERIAL IDENTIFICATION SYSTEM RATINGS

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HAZARD INDEX:

4 Severe Hazard	0 HEALTH
3 Serious Hazard	0 FLAMMABILITY
2 Moderate Hazard	0 REACTIVITY
1 Slight Hazard	
0 Minimal Hazard	

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N/A = Not Applicable NDA = No Data Available

ANSUL is a registered trademark.
Form No. F-85313-4

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OXYGEN

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* * * * *
* M S D S *
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* Canadian Centre for Occupational Health and Safety *
* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 76352
PRODUCT NAME(S) : Oxygen
CURRENCY NOTE : MSDS Confirmed Current: 1999-02-24

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Airco Specialty Gases
ADDRESS : 575 Mountain Avenue
Murray Hill New Jersey
U.S.A. 07974
Telephone: 201-464-8100

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : Applied Research Products
ADDRESS : Post Office Box 277 Cartierville
Montreal Quebec
Canada H4K 2J6

*** MATERIAL SAFETY DATA ***

MATERIAL SAFETY DATA SHEET

Product Name: Oxygen
----- (Chemical name is underlined)

Synonyms: None

CAS Number: 7782-44-7 DOT Hazard Class: Nonflammable gas

Chemical Formula: O2 DOT Identification Number: UN 1072

Chemical Family: Oxidizer

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OXYGEN

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Health Hazard Data

TWA: None established (ACGIH, 1984-85). Oxygen is the "vital element" in the atmosphere in which we live and breathe (approximately 21 molar % of the atmosphere.)

Symptoms of Exposure:

Breathing high concentrations (greater than 75 molar percent) causes symptoms of hyperoxia which include cramps, nausea, dizziness, hypothermia, amblyopia, respiratory difficulties, bradycardia, fainting spells and convulsions capable of leading to death. For additional information on hyperoxia, see Compressed Gas Association's Pamphlet P-14.

Toxicological Properties:

The property is that of hyperoxia which leads to pneumonia. Concentrations between 25 and 75 molar percent present a risk of inflammation of organic matter in the body.

Recommended First Aid Treatment:

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO OXYGEN. RESCUE PERSONNEL SHOULD BE COGNIZANT OF EXTREME FIRE HAZARD ASSOCIATED WITH OXYGEN-RICH ATMOSPHERES.

Conscious persons should be assisted to an uncontaminated area and breathe fresh air. They should be kept warm and quiet. The physician should be informed that the victim is experiencing (has experienced) hyperoxia.

Unconscious persons should be moved to an uncontaminated area and given assisted respiration. When breathing has been restored, treatment should be as above. Continued treatment should be symptomatic and supportive.

Hazardous Mixtures of Other Liquids, Solids, or Gases:

Oxygen vigorously accelerates combustion. Contact with all flammable materials should be avoided. Some materials which are not flammable in air will burn in pure oxygen or oxygen-enriched atmospheres.

Physical Data

Boiling Point: -297.3 deg F (-182.9 deg C)

Liquid Density @ Boiling Point: 71.23 lb/ft³ (1141 kg/m³)

Vapor Pressure @ 70 deg F (21.1 deg C): Above the critical temperatures of
-181.1 deg F (118.4 deg C)

Specific Gravity @ 70 deg F, 1 atm (Air=1): 1.11

Solubility in Water: Slightly

Freezing Point: -361.8 deg F (-218.8 deg C)

Appearance and Odor: Colorless, odorless gas

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OXYGEN

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Fire and Explosion Hazard Data

Flash Point (Method Used): N/A

Auto Ignition Temperature: N/A

LEL: N/A

UEL: N/A

Extinguishing Media: Copious quantities of water for fires with oxygen as the oxidizer.

Electrical Classification: Nonhazardous

Special Fire Fighting Procedures: If possible, stop the flow of oxygen which is supporting the fire.

Unusual Fire and Explosion Hazards: Vigorously accelerates combustion.

Reactivity Data

Stable

Conditions to Avoid:

Incompatibility (Materials to Avoid): All flammable materials

Hazardous Decomposition Products: None

Hazardous Polymerization:
Will not occur

Conditions to Avoid:

Spill or Leak Procedures

Steps to Be Taken in Case Material is Released or Spilled:

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 in container or container valve, contact CHEMTREC for emergency assistance or your closest Airco location.

Waste Disposal Method:

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 Airco for proper disposal.

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OXYGEN

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Special Protection Information

Respiratory Protection: N/A

Ventilation: To prevent accumulation above 25 molar percent.

Local Exhaust: To prevent accumulation above 25 molar percent.

Special:

Mechanical (Gen.):

Other:

Protective Gloves: As required; any material

Eye Protection: Safety goggles or glasses

Other Protective Equipment: Safety shoes, safety shower

Special Precautions

Special Labeling Information:

DOT Shipping Name: Oxygen or
Oxygen, compressed

DOT Hazard Class: Nonflammable gas

DOT Shipping Label: Oxidizer

I.D. No.: UN1072

Special Handling Recommendations:

Use only in well-ventilated areas. Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (< 3000 psig) 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.

For additional handling recommendations, consult Compressed Gas Association's Pamphlets P-1, P-14 and G-4.

Special Storage Recommendations:

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits and away from full or empty stored cylinders which contain flammable products. Do not allow the temperature where cylinders are stored to exceed 130F (54C). Cylinders should 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.

For additional storage recommendations, consult Compressed Gas Association's Pamphlets P-1, P-14 and G-4.

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OXYGEN

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Special Packaging Recommendations:

Carbon steels and low alloy steels are acceptable for use at lower pressures. For high pressure applications use stainless steels, copper and its alloys, nickel and its alloys, brass, bronze, silicon alloys, Monel(R), Inconel(R) or beryllium. Lead and silver or lead and tin alloys are good gasketing materials. Teflon(R) and Kel-F(R) are the preferred nonmetal gaskets.

Special Note: It should be recognized that the ignition temperature of metals and nonmetals in pure oxygen service decreases with increasing oxygen pressure.

Other Recommendations or Precautions:

Oxygen should not be used as a substitute for compressed air in pneumatic equipment since this type generally contains flammable lubricants. Equipment to contain oxygen must be "cleaned for oxygen service". See Compressed Gas Association Pamphlet G-4.1. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with his (written) consent is a violation of Federal Law (49CFR).

ISN: 76352

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2495764

PRODUCT NAME(S) : Pax 18

PRODUCT IDENTIFICATION : Code LA3238

DATE OF MSDS : 1999-07-09

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-12-20

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : VAN WATERS & ROGERS LTD

ADDRESS : 9800 Van Horne Way
Richmond British Columbia
Canada V6X 1W5

EMERGENCY TELEPHONE NO. : 800-424-9300 (CHEMTREC)

*** MATERIAL SAFETY DATA ***

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VAN WATERS & ROGERS LTD. 9800 VAN HORNE WAY RICHMOND, B C. V6X 1W5

WHMIS CODES: E

For Emergency Assistance
Involving Chemicals Call CHEMTREC
(800) 424-9300

WHMIS (Classification)
CLASS E: Corrosive liquid.

****Section I. Chemical Product Identification****

Product Name	Pax 18	Code	LA3238
		CAS#	Mixture.
Synonym	Pax-11, Pax-14, Pax-19, Pax-10.	DSL	On the DSL list.
Chemical Name	Not applicable.	CI#	Not available.
Chemical Family	Not available.		
Chemical Formula	Not applicable.		
Material Uses	Not available.		

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****Section II. Composition and Information on Ingredients****

Name	CAS #	% by Weight	LC50/LD50
Aluminum chlorohydrate	1327-41-9	<50	ORAL (LD50): Acute: 12780 mg/kg [Rat].
Water	7732-18-5	<50	ORAL (LD50): Acute: 99999 mg/kg [Rat.]. Chronic: 99999 mg/kg [Rat.]. DERMAL (LD50): Acute: 99999 mg/kg [Rat.]. Chronic: 99999 mg/kg [Rat.]. GAS (LC50): Acute: 99999 ppm 4 hour(s) [Rat.]. Chronic: 99999 ppm 4 hour(s) [Rat.]. VAPOR (LC50): Acute: 99999 ppm 4 hour(s) [Rat.]. Chronic: 99999 ppm 4 hour(s) [Rat.]. DUST (LC50): Acute: 73659.8 mg/m3 4 hour(s) [Rat.]. Chronic: 73659.8 mg/m3 4 hour(s) [Rat.].

****Section III. Hazards Identification****

Potential Acute Health Effects Extremely hazardous in case of ingestion. Very hazardous in case of skin contact (irritant), of eye contact (irritant, corrosive). Hazardous in case of inhalation. Corrosive to skin and eyes on contact. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects CARCINOGENIC EFFECTS: Not available.
 MUTAGENIC EFFECTS: Not available.
 TERATOGENIC EFFECTS: Not available.
 DEVELOPMENTAL TOXICITY: Not available.
 Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation.
 Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection.

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****Section IV. First Aid Measures****

Eye Contact	Check for and remove any contact lenses. IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. COLD water may be used. DO NOT use an eye ointment. Seek medical attention.
Skin Contact	If the chemical got onto the clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower. If the chemical got on the victim's exposed skin, such as the hands : Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. COLD water may be used. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.
Hazardous Skin Contact	Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.
Inhalation	Allow the victim to rest in a well ventilated area. Seek immediate medical attention.
Hazardous Inhalation	Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.
Ingestion	DO NOT induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.
Hazardous Ingestion	Not available.

****Section V. Fire and Explosion Data****

The Product is: May be combustible at high temperature.

Auto-Ignition Temperature Not available.

Flash Points Not available.

Flammable LimitsNot available.

Products of Combustion Not available.

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Fire Hazards in Slightly flammable to flammable in presence of open flames
Presence of and sparks, of heat.
Various Non-flammable in presence of oxidizing materials, of
Substances reducing materials, of combustible materials.

Explosion Risks of explosion of the product in presence of mechanical
Hazards in impact: Not available.
Presence of Risks of explosion of the product in presence of static
Various discharge: Not available.
Substances

Fire Fighting SMALL FIRE: Use DRY chemical powder.
Media LARGE FIRE: Use water spray, fog or foam. DO NOT use
and Instructions water jet.

Special Remarks Not available.
on
Fire Hazards

Special Remarks Not available.
on Explosion
Hazards

****Section VI. Accidental Release Measures****

Small Spill Absorb with an inert material and place in an appropriate
waste disposal container.

Large Spill Corrosive liquid.
Stop leak if without risk. Absorb with DRY earth, sand or
other non-combustible material. DO NOT get water inside
container. DO NOT touch spilled material. Use water spray
curtain to divert vapor drift. Prevent entry into sewers,
basements or confined areas; dike if needed. Eliminate all
sources of ignition. Call for assistance on disposal.
Neutralize the residue with a dilute solution of sodium
carbonate.

****Section VII. Handling and Storage****

Precautions Keep container dry. Keep away from heat. Keep away from
sources of ignition. Empty containers pose a fire risk,
evaporate the residue under a fume hood. Ground all
equipment containing material. DO NOT ingest. Do not
breathe gas, fumes, vapor or spray. Never add water to
this product In case of insufficient ventilation, wear
suitable respiratory equipment If ingested, seek medical
advice immediately and show the container or the label.
Avoid contact with skin and eyes Keep away from
incompatibles such as alkalis.

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Storage	Keep container dry. Keep in a cool place. Ground all equipment containing material. Corrosive materials should be stored in a separate safety storage cabinet or room.
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****Section VIII. Exposure Controls/Personal Protection****

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
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Personal Protection	Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.
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Personal Protection in Case of a Large Spill	Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
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Exposure Limits Not available.

****Section IX. Physical and Chemical Properties****

Physical State and Appearance	Liquid.	Odor	Pungent chlorine.
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Taste	Not available.
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Molecular Weight Not applicable.

pH (1% soln/water)	0.5 [Acidic.]	Color	Clear	Amber.
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Boiling Point 100 C (212 F)

Melting Point -20 C (-4 F)

Critical Temperature	Not available.
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Specific Gravity 1.2 (Water = 1)

Vapor Pressure The highest known value is 17.2 mm of Hg (@ 20 C) (Water).

Vapor Density The highest known value is 1 (Air = 1) (Water).

Volatility	Not available.
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Odor Threshold	Not available.
Evaporation rate	Not available.
Viscosity	Not available.
Water/Oil Dist. Coeff.	The product is much more soluble in water.
Ionicity (in Water)	Not available.
Dispersion Properties	See solubility in water, methanol.
Solubility	Easily soluble in cold water, hot water, methanol. Insoluble in diethyl ether, n-octanol.

****Section X. Stability and Reactivity Data****

Stability	The product is stable.
Instability Temperature	Not available.
Conditions of Instability	Contact with Aluminum and Zinc may release hydrogen gas.
Incompatibility with various substances	Reactive with alkalis. Non-reactive with organic materials, metals.
Corrosivity	Not considered to be corrosive for metals and glass according to our database.
Special Remarks on Reactivity	Hazardous Decomposition Products: May include toxic fumes of chlorine and aluminum compounds.
Special Remarks on Corrosivity	Not available.
Hazardous Polymerization	No.

****Section XI. Toxicological Information****

Routes of Entry	Eye contact. Inhalation. Ingestion.
Toxicity to Animals	Acute oral toxicity (LD50): 25818 mg/kg (Rat) (Calculated value for the mixture).

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Chronic Effects on Humans	CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection.
Other Toxic Effects on Humans	Extremely hazardous in case of ingestion. Very hazardous in case of skin contact (irritant), of eye contact (irritant, corrosive). Hazardous in case of inhalation. Corrosive to skin and eyes on contact. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.
Special Remarks on Toxicity to Animals	Not available.
Special Remarks on Chronic Effects on Humans	May cause redness, defatting and dermatitis of the exposed area. Repeated or prolonged contact may result in conjunctivitis.
Special Remarks on Other Toxic Effects on Humans	Not available.

****Section XII. Ecological Information****

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Products of Biodegradation	Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation	Not available.
Special Remarks	Not available.

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on the Products
of
Biodegradation

****Section XIII. Disposal Considerations****

Waste Disposal Recycle to process, if possible. Consult your local or
regional authorities.

****Section XIV. Transport Information****

TDG CLASS 8: Corrosive liquid.
Classification Class 9.2: Environmentally hazardous material.

Shipping name Corrosive liquids n.o.s. (Aluminum chlorohydrate)

PIN UN1760

Packing Group III

Special No additional remark.
Provisions for
Transport

****Section XV. Other Regulatory Information****

Other Regulations OSHA: Hazardous by definition of Hazard Communication
Standard (29 CFR 1910.1200).

****Section XVI. Other Information****

References Not available.

Other Special Not available.
Considerations

Validated by Hardev Bendick on Verified by Hardev Bendick.
7/7/99.

Information EH&S Department
Contact Vancouver, B C.
 (604) 273-1441

FOR UPDATED COPIES OF AN MSDS, PLEASE CONTACT YOUR LOCAL VAN WATERS &
ROGERS LTD. BRANCH.

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Notice to Reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Van Waters & Rogers Ltd. expressly disclaims all expressed or implied warranties of merchantability and fitness for a particular purpose with respect to the product provided.

===== END OF MSDS =====

/HMIS Msds/HMIS/056/BWPML.HTM (4 hits)



Get the most comprehensive
MSDS/HazCom program on the market!

PERCOL 763

Product and Company Identification
Composition/Information on Ingredients
Hazards Identification
First Aid Measures
Fire Fighting Measures
Accidental Release Measures
Handling and Storage
Exposure Controls/Personal Protection

Physical and Chemical Properties
Stability and Reactivity
Toxicological Information
Ecological Information
Disposal Considerations
Transport Information
Regulatory Information
Other Information / Hazmat Info / Hazcom Label

MSDS Safety Information

TOP

FSC: 6850

MSDS Date: 07/16/1992 MSDS Num: BWPML

Submitter: N EN

LIIN: 00N057185

Tech Review: 02/03/1995

Status CD: C

Product PERCOL 763

MFN: 01

ID:

Article: N

Kit N
Part:

Responsible Party

Cage: 4S341

Name: ALLIED COLLOIDS INC

Address: 2301 WILROY RD

Box: 820

City: SUFFOLK

State: VA

Zip: 23439-0820

Country: US

Info Phone Number: 804-538-3700

Emergency Phone Number: 800-424-9300 (CHEMTREC)

Preparer's Name: N/P

Proprietary Ind: N

Review Ind: N

Published: Y

Special Project CD: N

Contractor Summary

TOP

Cage: 4S341

Name: ALLIED COLLOIDS INC

Address: UNKNOWN
City: SUFFOLK

State: VA

Zip: 23434

Country: US

Phone: 804-934-3700

Ingredients

[TOP](#)

Cas: 124-04-9

Code: M

RTECS #: AU8400000 Code: M

Name: ADIPIC ACID (CERCLA)

% Text: N/K

Environmental Wt:
Other REC Limits: N/K

OSHA PEL: N/K (FP N)

Code: M

OSHA

Code:

ACGIH TLV: 5 MG/M3; 9495

Code: M

STEL:

Code:

ACGIH N/P

STEL:

EPA Rpt Qty: 5000 LBS

DOT Rpt 5000 LBS

Qty:

Ozone Depleting Chemical: N

Cas: 69418-26-4

Code: M

RTECS #: 1012342CD Code: M

Name: COPOLYMER ACRYLAMIDE:DMAEA Q. (MECL)

% Text: N/K

Environmental Wt:
Other REC Limits: N/K

OSHA PEL: N/K (FP N)

Code: M

OSHA

Code:

ACGIH TLV: N/K (FP N)

Code: M

STEL:

Code:

ACGIH N/P

STEL:

EPA Rpt Qty:

DOT Rpt

Qty:

Ozone Depleting Chemical:

Cas: 7732-18-5

Code: M

RTECS #: ZC0110000 Code: M

Name: WATER

% Text: N/K

Environmental Wt:
Other REC Limits: N/K

OSHA PEL: N/K (FP N)

Code: M

OSHA

Code:

STEL:

ACGIH TLV: N/K (FP N)

Code: M

ACGIH N/P

Code:

STEL:

EPA Rpt Qty:

DOT Rpt

Qty:

Ozone Depleting Chemical: N

Health Hazards Data

TOP

LD50 LC50 Mixture NONE SPECIFIED BY MANUFACTURER.

Route Of Entry Inds - Inhalation: YES

Skin: NO

Ingestion: NO

Carcinogenicity Inds - NTP: NO

IARC: NO

OSHA: NO

Health Hazards Acute And Chronic

ACUTE: CONTACT WITH EYE MAY PRODUCE IRRITATION AND/OR REDNESS. INHALED DUST MAY CAUSE SOME RESPIRATORY IRRITATION.

Explanation Of Carcinogenicity

NOT RELEVANT.

Signs And Symptoms Of Overexposure

SEE HEALTH HAZARDS.

Medical Cond Aggravated By Exposure

NONE SPECIFIED BY MANUFACTURER.

First Aid Information

TOP

EYE: IMMEDIATELY FLUSH W/PLENTY OF WATER FOR @ LEAST 15 MINS. CALL PHYS.
INGEST: DO NOT GIVE AN EMETIC UNLESS DIRECTED BY PHYS. NEVER GIVE
ANYTHING BY MOUTH TO UNCON PERSON. SKIN: REMOVE CONTAMINATED CLOTHING &
LAUNDRY BEFORE REUSE. WASH AFFECTED AREA W/ SOAP & WATER. INHALATION: REMOVE
TO FRESH AIR.

Spill Release Procedures

TOP

PRODUCT BECOMES SLIPPERY & DANGEROUS TO HANDLE WHEN WET; SPILLS ARE BEST HANDLED
WHILE STILL DRY. SWEEP UP & COLLECT DRY PRODUCT. ABSORB WET PRODUCT
W/VERMICULITE/OTHER INERT MATERIAL. THEN WATER WASH AREA TO WASTE
TREATMENT TO ELIMINATE SLIP HAZARD.

Neutralizing Agent

NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Methods

TOP

DISP MUST BE ARRANGED I/A/W LOCAL, ST & FED REGS. THIS MATL, WHEN UNADULTERATED, IS NOT RCRA REGULATED HAZ WASTE. HOWEVER, LOCAL DISP REGS WILL OFTEN APPLY. CARE MUST BE TAKEN TO PVNT ENVIRON CONTAM FROM DISP OF MATL, RESIDUE & CNTNRS.

Handling and Storage Precautions[TOP](#)

DO NOT GET IN EYES, ON SKIN, ON CLTHG. AVOID PRLNGD/RPTD INHAL OF DUST. AVOID PRLNGD/RPTD SKIN CONT. CAUTION -SLIP HAZS - SEE SECTION IV AND/OR VII.

Other Precautions

NONE SPECIFIED BY MANUFACTURER.

Fire and Explosion Hazard Information[TOP](#)

Flash Point Method: N/P

Flash Point:

Flash Point Text: N/A

Autoignition Temp:

Autoignition Temp Text: N/A

Lower Limits: N/A

Upper Limits: N/A

Extinguishing Media

CARBON DIOXIDE, DRY CHEMICAL OR FOAM.

Fire Fighting Procedures

NO SPEC PROCS. HOWEVER, WETTED PROD PRESENTS SLIP HAZ. PEDESTRIAN & VEHICULAR TRAFFIC MUST PROCEED W/CAUTION WHERE WET PROD MAY EXIST. NIOSH/MSHA APPRVD(SUPDAT)

Unusual Fire/Explosion Hazard

DUST IN SUFFICIENT CONCENTRATION CAN RESULT IN EXPLOSIVE MIXTURE IN AIR. HANDLE TO MINIMIZE DUSTING & ELIMINATE OPEN FLAME & OTHER SOURCES OF IGNIT.

Control Measures[TOP](#)**Respiratory Protection**

NIOSH/MSHA APPROVED DUST RESPIRATOR AS REQD TO CONTROL EXPOS. FOLLOW ANSI Z88.2.

Ventilation

PROVIDE MECH VENT TO PVNT DUST CONC, AND TO REDUCE POTNTL EXPOSURE.

Protective Gloves

IMPERVIOUS GLOVES (FP N).

Eye Protection

GOGG (ANSI Z87.1 STD; SFTY (SUPDAT)

Other Protective Equipment

PROVIDE EYEWASH STATION(S). SELECT ADDTNL PROT EQUIP (EG APRON, FACE SHIELD, ETC.), DEPENDING ON CNDTNS OF USE.

Work Hygienic Practices

WASH THORO AFTER HANDLING.

Supplemental Safety and Health

SOL IN H*2O:SOLUBLE-SOLUBILITY LIMITED BY VISCOSITY. FIRE FIGHT PROC:SCBA & FULL PROT EQUIP (FP N). HAZ DECOMP PROD:CHLORIDE VAP. VAP MAY BE IRRITATING/HARMFUL. EYE PROT:GLASSES ALONE DO NOT PROTECT FROM DUST).

Physical/Chemical Properties[TOP](#)**HCC:****NRC/State LIC No:****Net Prop WT For Ammo:****Boiling Point:****B.P. Text: N/A****Melt/Freeze Pt:****M.P/F.P Text: N/K****Decomp Temp:****Decomp Text: N/K****Vapor Pres: N/A****Vapor Density: N/A****Volatile Org Content %:****Spec Gravity: 0.8-1.0****VOC Pounds/Gallon:****PH: N/A****VOC Grams/Liter:****Viscosity: N/P****Evaporation Rate & NOT APPLICABLE****Reference:****Solubility in Water: SUPP DATA****Appearance and Odor: WHITE FREE FLOWING MICRO BEADS WITH LITTLE OR NO ODOR****Percent Volatiles by Volume: N/A****Corrosion Rate: N/K**

Seton Resource Center

*Allow access to non-virtual folders: 0***Reactivity Data**[TOP](#)**Stability Indicator: YES****Stability Condition To Avoid: NONE SPECIFIED BY MANUFACTURER.****Materials To Avoid: STRONG OXIDANTS SUCH AS LIQUID CHLORINE, ENRICHED GASEOUS/LIQUID OXYG, & SODIUM OR CALCIUM HYPOCHLORITE.**

Hazardous Decomposition THERMAL DECOMP/COMBUST MAY
Products: PRODUCE OXIDES OF CARBON & NITROGEN,
VARIOUS HYDROCARB, AMMONIA AND/OR
HYDROGEN (SUPDAT)

Hazardous Polymerization NO
Indicator:
Conditions To Avoid NOT RELEVANT.
Polymerization:

Toxicological Information**Toxicological Information:** N/P**Ecological Information****Ecological:** N/P**MSDS Transport Information****Transport Information:** N/P**Regulatory Information****Sara Title III Information:** N/P**Federal Regulatory Information:** N/P**State Regulatory Information:** N/P**Other Information****Other** N/P
Information:**HMIS HAZCOM Label****TOP****Product ID:** PERCOL 763**Cage:** 4S341**Assigned IND:** N**Company Name:** ALLIED COLLOIDS INC
Street: UNKNOWN**PO Box:****City:** SUFFOLK
Country: US**State:** VA**Zipcode:** 23434**Health Emergency Phone:** 800-424-9300 (CHEMTREC)

Label Required IND: Y
Status Code: C
Label Date: 02/03/1995

Date Of Label Review: 02/03/1995
MFG Label NO:
Year Procured: N/K

Origination Code: G
Eye Protection IND: YES

Chronic Hazard IND: N
Skin Protection IND: YES

Signal Word: CAUTION

Respiratory Protection IND: YES

Health Hazard: Slight
Contact Hazard: Slight

Fire Hazard: None
Reactivity Hazard: None

Hazard And Precautions

ACUTE: CONTACT WITH EYE MAY PRODUCE IRRITATION AND/OR REDNESS. INHALED DUST MAY CAUSE SOME RESPIRATORY IRRITATION. CHRONIC: NONE LISTED BY MANUFACTURER.

This information is derived from the Hazardous Material Information System which is utilized by the U.S. Department of Defense. IntraWEB, LLC and its Distributors in no manner whatsoever, expressly or implied warrants, states, or intends said information to have any application use or viability by or to any person or persons. Any person utilizing this information should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular situation.

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POLYACRYLAMIDE

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2415914

PRODUCT NAME(S) : Bio-Phore Polyacrylamide

PRODUCT IDENTIFICATION : Article number: 1610410

DATE OF MSDS : 2000-08-17

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-08-24

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : Bio-Rad Laboratories Ltd

ADDRESS : 5671 McAdam Road
Mississauga Ontario
Canada L4Z 1N9
Telephone: 905-712-2771 (Information
department: Technical services, customer
support)

EMERGENCY TELEPHONE NO. : 905-712-2771

Printing date 08/17/2000

Reviewed on 08/17/2000

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1 Identification of substance:

Product details:

Trade name: Bio-Phore Polyacrylamide

Article number: 1610410

Manufacturer/Supplier:
Bio-Rad Laboratories Ltd.
5671 McAdam Road
Mississauga, Ontario L4Z 1N9

1(905)712-2771

Information department: Technical services, customer support.
Emergency information: 1(905)712-2771

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2 Composition/Data on components:

Chemical characterization
Description:
Mixture of the substances listed below with nonhazardous additions.

POLYACRYLAMIDE

Dangerous components:

7732-18-5 water 50-100 %
EINECS Number: 231-791-2
RTECS: ZC 0110000

25034-58-6 Polyacrylamide-co-methylene-bis-acrylamide 10-20 %
EU Number: 585-580-00-X

3 Hazards identification

Hazard description: not applicable
Information pertaining to particular dangers for man and environment
not applicable
Classification system
The classification was made according to the latest editions of the EU-
lists, and expanded upon from company and literature data.

4 First aid measures

General information No special measures required.
After inhalation
Supply fresh air; consult doctor in case of complaints.
After skin contact Generally the product does not irritate the skin.
After eye contact
Rinse opened eye for several minutes under running water.
After swallowing Induce vomiting and call for medical help.

5 Fire fighting measures

Suitable extinguishing agents
CO₂, extinguishing powder or water spray. Fight larger fires with water
spray or alcohol resistant foam.
Protective equipment: No special measures required.

6 Accidental release measures

Person-related safety precautions: Not required.
Measures for environmental protection: No special measures required.
Measures for cleaning/collecting: Ensure adequate ventilation.
Additional information: No dangerous substances are released.

POLYACRYLAMIDE

7 Handling and storage

Handling

Information for safe handling:

No special measures required.

Ensure good ventilation/exhaustion at the workplace.

No special precautions are necessary if used correctly.

Information about protection against explosions and fires:

No special measures required.

Storage

Requirements to be met by storerooms and receptacles:

No special requirements.

Information about storage in one common storage facility: Not required.

Further information about storage conditions: None.

Storage class

Class according to regulation on flammable liquids: Void

8 Exposure controls and personal protection

Additional information about design of technical systems:

No further data; see item 7.

Components with limit values that require monitoring at the workplace:

The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

Additional information:

The lists that were valid during the creation were used as basis.

Personal protective equipment

General protective and hygienic measures

The usual precautionary measures should be adhered to when handling chemicals.

Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Protection of hands:

Protective gloves.

Synthetic gloves

Eye protection: Not required.

9 Physical and chemical properties:

Form: Solid.

Colour: Clear

Odour: Odourless

POLYACRYLAMIDE

	Value/Range	Unit	Method
Change in condition			
Melting point/Melting range:	undetermined		
Boiling point/Boiling range:	100	C	
Flash point:	Not applicable		
Self igniting:	Product is not selfigniting.		
Danger of explosion:			
Product does not present an explosion hazard.			
Vapour pressure:	at 20	C	23.0 hPa
Density:	Not determined		
Solubility in / Miscibility with Water:	Fully miscible		
Solvent content:			
Organic solvents:	0.0	%	
Water:	88.0	%	
Solids content:	7.5	%	

10 Stability and reactivity

Thermal decomposition / conditions to be avoided:
No decomposition if used according to specifications.
Dangerous reactions No dangerous reactions known
Dangerous products of decomposition:
No dangerous decomposition products known

11 Toxicological information

Acute toxicity:
Primary irritant effect:
on the skin: No irritant effect.
on the eye: No irritating effect.
Sensitization: No sensitizing effects known.
Additional toxicological information:
The product is not subject to classification according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

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POLYACRYLAMIDE

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12 Ecological information:

General notes: Not known to be hazardous to water.

13 Disposal considerations

Product:

Recommendation Hand over to hazardous waste disposers.

Uncleaned packagings:

Recommendation:

Disposal must be made according to official regulations.

14 Transport information

Land transport ADR/RID (cross-border)

ADR/RID class: -

Maritime transport IMDG:

IMDG Class: -

Marine pollutant: No

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class: -

15 Regulations

Markings according to EU guidelines:

Observe the general safety regulations when handling chemicals

The product is not subject to identification regulations under EU Directives and the Ordinance on Hazardous Materials (GefStoffV).

Safety phrases:

60 This material and its container must be disposed of as hazardous waste.

National regulations

Classification according to VbF: Void

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POLYACRYLAMIDE

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16 Other information:

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Department issuing MSDS: Environmental Health and Safety.

Contact:

Life Science Group, Environmental Health and Safety, 2000 Alfred Nobel Drive, Hercules, California, 94547: 1(510) 741-1000

Diagnostic Group, Juliet Carrara, 4000 Alfred Nobel Drive, Hercules, California, 94547: 1(510) 724-7000

+-----CDN-----+

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POLYETHYLENE GLYCOL

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* * * * *

* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2453790

PRODUCT NAME(S) : POLYETHYLENE GLYCOL

PRODUCT IDENTIFICATION : MSDS NUMBER: P5029

PRODUCT CODE: U204, U214, U215, U216,
U218, U220, U221, U222, 7755, E922, H273

C.A.S. NUMBER: 25322-68-3

DATE OF MSDS : 1999-11-17

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-11-14

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Mallinckrodt Baker, Inc

ADDRESS : 222 RED SCHOOL LANE
PHILLIPSBURG NEW JERSEY
U.S.A. 08865
Telephone: 800-582-2537 (Customer
Service)

EMERGENCY TELEPHONE NO. : 908-859-2151
800-424-9300 (CHEMTREC, USA)
703-527-3887 (Outside USA & CANADA)
613-996-6666 (CANUTEC)

*** MATERIAL SAFETY DATA ***

Effective Date: 11/17/99
Supercedes: 12/08/96

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MSDS MATERIAL SAFETY DATA SHEET

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From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

CHEMTREC: 800-424-9300 (USA)
703-527-3887
(Outside USA & CANADA)
CANUTEC: 613-996-6666

Emergency Telephone Number: 908-859-2151

NOTE: Use CHEMTREC and CANUTEC
phone numbers only in the event
of a chemical emergency.

All non-emergency questions should be directed to Customer Service
(1-800-582-2537) for assistance.

M A L L I N C K R O D T

J . T . B A K E R

=====

POLYETHYLENE GLYCOL

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1. Product Identification

Synonyms: PEG; Carbowax(R); Polyglycol; Polyethylene glycol 200, 300, 400, 600, 1000, 1450, 3350, 4000, 6000, 8000 and 20000.

CAS No: 25322-68-3

Molecular Weight: Not applicable to mixtures.

Chemical Formula: (C₂H₄O)_n.H₂O

Product Codes: J.T. Baker:
U204, U214, U215, U216, U218, U220, U221, U222
Mallinckrodt:
7755, E922, H273

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2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Polyethylene Glycol	25322-68-3	90 - 100%	No

=====

3. Hazards Identification

Emergency Overview

As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 0 - None
Flammability Rating: 1 - Slight
Reactivity Rating: 0 - None
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:

No adverse health effects expected from inhalation. (May be a mechanical irritant.)

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POLYETHYLENE GLYCOL

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Ingestion:

Large doses of the lower molecular weight products may cause gastro-intestinal upset.

Skin Contact:

No adverse effects expected.

Eye Contact:

No adverse effects expected.

Chronic Exposure:

No information found.

Aggravation of Pre-existing Conditions:

Damaged skin.

=====

4. First Aid Measures

Inhalation:

Not expected to require first aid measures.

Ingestion:

If large amounts were swallowed, give water to drink and get medical advice.

Skin Contact:

In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Get medical attention if irritation develops or persists.

Eye Contact:

In case of contact, flush eyes with plenty of water for at least 15 minutes. Get medical advice if irritation develops.

=====

5. Fire Fighting Measures

Fire:

As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source. (increases as molecular weight increases). Flash point: 182 - 287 C.

Explosion:

Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

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POLYETHYLENE GLYCOL

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Fire Extinguishing Media:

Water spray, dry chemical, alcohol foam, or carbon dioxide.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

=====

6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8.

Solid Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container.

Liquid Spills: Absorb with vermiculite, dry sand, earth or similar material and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer.

=====

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids, vapors, liquid); observe all warnings and precautions listed for the product.

=====

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

AIHA Workplace Environmental Exposure Level (WEEL):
10 mg/m³, 8-hour, TWA

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

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POLYETHYLENE GLYCOL

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Personal Respirators (NIOSH Approved):

For use with solids (not required for liquids): If the exposure limit is exceeded, a half-face dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear protective gloves and clean body-covering clothing.

Eye Protection:

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

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9. Physical and Chemical Properties

Appearance:

Clear liquid or white solid.

Boiling Point:

No information found.

Odor:

Mild odor.

Melting Point:

Melting point increases as molecular weight increases:

PEG 400 = 4-8C (39-46F)

PEG 600 = 20-25C (68-77F)

PEG1500 = 44-48C (111-118F)

PEG 4000 = 54-58C (129-136F)

PEG 6000 = 56-63C (133-145F)

Solubility:

Soluble in water.

Vapor Density (Air=1):

No information found.

Density:

range: 1.1 to 1.2 (increases as molecular weight increases)

Vapor Pressure (mm Hg):

Vapor pressure is very low; as molecular weight increases, vapor pressure decreases.

pH:

No information found.

Evaporation Rate (BuAc=1):

No information found.

% Volatiles by volume @ 21C (70F):

No information found.

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POLYETHYLENE GLYCOL

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10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Carbon dioxide and carbon monoxide may form when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Incompatible with polymerization catalysts (peroxides, persulfates) and accelerators, strong oxidizers, strong bases and strong acids.

Conditions to Avoid:

Incompatibles.

=====

11. Toxicological Information

Oral Rat LD50 for:

PEG 200 = 28gm/kg; PEG 300 = 27.5gm/kg; PEG 400 = 30.2gm/kg; PEG 600 = 30gm/kg; PEG 1000 = 32gm/kg; PEG 1450 = > 4gm/kg; PEG 4000 = 50gm/kg; PEG 6000 = > 50gm/kg; PEG 20000 = 31.6gm/kg

Polyethylene glycol has been investigated as a mutagen; PEG 1000 has been investigated as a tumorigen.

-----\Cancer Lists\-----			
---NTP Carcinogen---			
Ingredient	Known	Anticipated	IARC Category

Polyethylene Glycol (25322-68-3)	No	No	None

=====

12. Ecological Information

Environmental Fate:

No information found.

Environmental Toxicity:

No information found.

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POLYETHYLENE GLYCOL

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13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations.

Dispose of container and unused contents in accordance with federal, state and local requirements.

=====

14. Transport Information

Not regulated.

=====

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\----- Ingredient	TSCA	EC	Japan	Australia
Polyethylene Glycol (25322-68-3)	Yes	No	Yes	Yes

-----\Chemical Inventory Status - Part 2\----- Ingredient	Korea	DSL	Canada NDSL	Phil.
Polyethylene Glycol (25322-68-3)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\----- Ingredient	-SARA 302- RQ	TPQ	-----SARA 313----- List	Chemical Catg.
Polyethylene Glycol (25322-68-3)	No	No	No	No

-----\Federal, State & International Regulations - Part 2\----- Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Polyethylene Glycol (25322-68-3)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
 SARA 311/312: Acute: No Chronic: No Fire: No Pressure: No
 Reactivity: No (Pure / Solid)
 Australian Hazchem Code: No information found.
 Australian Poison Schedule: No information found.

=====

POLYETHYLENE GLYCOL

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WHMIS: This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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16. Other Information

NFPA Ratings:
Health: 0 Flammability: 1 Reactivity: 0

Label Hazard Warning:
As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.

Label Precautions:
None.

Label First Aid:
Not applicable.

Product Use:
Laboratory Reagent.

Revision Information:
No changes.

Disclaimer:

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Prepared by: Strategic Services Division
Phone Number: (314) 654-1600 (U.S.A.)

P5029

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PROPANE

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 1434217

PRODUCT NAME(S) : H - D 5 PROPANE

DATE OF MSDS : 1997-02-18

*** MANUFACTURER INFORMATION ***

MANUFACTURER : IRVING OIL LIMITED

ADDRESS : Post Office Box 1421
Saint John New Brunswick
Canada E2L 4K1
Telephone: 506-632-2000

EMERGENCY TELEPHONE NO. : 506-648-3060

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*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : IRVING OIL LIMITED

ADDRESS : Post Office Box 1421
Saint John New Brunswick
Canada E2L 4K1
Telephone: 506-632-2000

EMERGENCY TELEPHONE NO. : 506-648-3060

*** MATERIAL SAFETY DATA ***

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PROPANE

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MATERIAL SAFETY DATA SHEET

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1. PRODUCT INFORMATION

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PRODUCT IDENTIFIER	IRVING PRODUCT CODE	
H - D 5 PROPANE		
WHMIS	CLASS A - COMPRESSED GAS	Application and Use
Classification	CLASS B, DIVISION 1: FLAMMABLE GAS	AUTOMOTIVE OR SPACE HEATER FUEL

=====

2. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

=====

Physical State
Gas [X] Liquid [X] Solid []

Odour and Appearance COLOURLESS & ODORLESS WITHOUT MORCEPTON ADD

Odour Threshold (p.p.m.) 4800

Specific Gravity .500 @ 15 deg C

Vapour Pressure (mm) 954 KPA @ 29.0 C

Vapour Density (Air = 1) 1.6

Evaporation Rate RAPID

Boiling Point (deg C) -40 C

Freezing Point (deg C) -190 C

Solubility in Water (20 deg C) 6.1

% Volatile (by volume) NOT AVAILABLE

pH NOT AVAILABLE

Density (g/cm3) .5

Coefficient of water/oil dist. NOT AVAILABLE

=====

3. HAZARDOUS INGREDIENTS OF MATERIAL

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Hazardous Ingredients	Approximate Concentration %	C.A.S. N.A. or U.N. Numbers
PROPANE	95-98%	74-98-6
LD50 Specify Species and Route:	NOT AVAILABLE	
LC50 Specify Species and Route:	NOT AVAILABLE	
ETHANE	3-5%	74-84-0
LD50 Specify Species and Route:	NOT AVAILABLE	
LC50 Specify Species and Route:	NOT AVAILABLE	
BUTANE	1-3%	79-10-68
LD50 Specify Species and Route:	NOT AVAILABLE	
LC50 Specify Species and Route:	NOT AVAILABLE	
ISO-BUTANE	0.1-0.3%	75-28-5
LD50 Specify Species and Route:	NOT AVAILABLE	
LC50 Specify Species and Route:	NOT AVAILABLE	

=====

PROPANE

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METHANE 0.1-0.2% 74-82-8
LD50 Specify Species and Route: NOT AVAILABLE
LC50 Specify Species and Route: NOT AVAILABLE

=====

4. HEALTH HAZARD INFORMATION

=====

ROUTE OF ENTRY
SKIN CONTACT [X] SKIN ABSORPTION [] EYE CONTACT [X]
INHALATION [X] INGESTION []
EFFECTS OF ACUTE EXPOSURE TO PRODUCT
HIGH CONCENTRATIONS CAN CAUSE OXYGEN DEFICIENCY BY DISPLACING AIR AND CAUSE
RAPID BREATHING, FATIGUE, INCOORDINATION, EXCESSIVE SALIVATION, HEADACHE,
NAUSEA, VOMITING AND DISORIENTATION.
EFFECTS OF CHRONIC EXPOSURE TO PRODUCT
IF NOT REMOVED MAY CAUSE CONVULSIONS LOSS OF CONSCIOUSNESS AND DEATH.
10 MINUTES TO 10,000 PPM HAS PRODUCED DROWSINESS.
REPRODUCTIVE TOXICITY
NOT AVAILABLE
EXPOSURE LIMITS
1000 PPM FOR DAILY 8 HR EXPOSURE
IRRITANCY OF PRODUCT
MINOR SKIN AND EYE (GAS) (LIQUID) - EYE INJURY, FROST BITE, RESPIRATORY
PROBLEMS
SENSITIZATION TO PRODUCT
NOT AVAILABLE
CARCINOGENICITY
NOT AVAILABLE
TERATOGENICITY
NOT AVAILABLE
MUTAGENICITY
NOT AVAILABLE
SYNERGISTIC PRODUCTS
NOT AVAILABLE

=====

5. FIRE AND EXPLOSION HAZARD

=====

FLAMMABILITY IF YES, UNDER LIQUID EVAPORATES AND FORMS FUMES,
YES [X] NO [] WHICH CONDITIONS? WHICH CAN EXPLODE OR BURN QUICKLY
IF IGNITED.

MEANS OF EXTINCTION which conditions
STOPFLOW - CO2 OR DRY CHEMICAL WATER FOG PRODUCED BY SPECIAL NOZZLE IS
EFFECTIVE BUT REQUIRES EXPERIENCE.
SPECIAL PROCEDURES
DO NOT ENTER ANY ENCLOSED OR CONFINED SPACE WITHOUT PROPER PROTECTIVE
EQUIPMENT INCLUDE SELF - CONTAINED BREATHING APPARATUS.
FLASHPOINT (DEG C) AND METHOD
-140 deg C

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PROPANE

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UPPER FLAMMABLE LIMIT (% BY VOLUME)

9.5%

LOWER FLAMMABLE LIMIT (% BY VOLUME)

2.4%

AUTO IGNITION TEMPERATURE (DEG C)

432 deg C

TDG FLAMMABILITY CLASSIFICATION

UN 1978 / 2.1

HAZARDOUS COMBUSTION PRODUCTS

SMOKE, CARBON MONOXIDE, CARBON DIOXIDE

EXPLOSION SENSITIVITY TO IMPACT SENSITIVITY TO STATIC DISCHARGE
DATA

=====

6. FIRST AID MEASURES

=====

INHALATION

REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF BREATHING HAS STOPPED.
CALL DOCTOR.

INGESTION

NOT EXPECTED TO BE AN INGESTION PROBLEM.

EYE

IF THE LIQUID SPLASHED IN EYES FLUSH IMMEDIATELY WITH FRESH WATER FOR AT
LEAST 15 MINUTES. CALL A DOCTOR.

SKIN

SOAK THE AFFECTED AREA IN LUKEWARM WATER. SEE DOCTOR FOR FROSTBITE OR

BURNS.

GENERAL ADVICE

=====

7. PREVENTIVE AND CORRECTIVE MEASURES

=====

PERSONAL PROTECTIVE EQUIPMENT

PROTECT FROM SKIN CONTACT

GLOVES (SPECIFY)

IMPERVIOUS PROTECTIVE GLOVES

RESPIRATORY (SPECIFY)

CARTRIDGE RESPIRATOR-OR-AIR SUPPLIED

EYE (SPECIFY)

CHEMICAL SAFETY GLASSES

FOOTWEAR (SPECIFY)

CLOTHING (SPECIFY)

IMPERVIOUS PROTECTIVE CLOTHING

OTHER (SPECIFY)

ENGINEERING CONTROLS (SPECIFY, E.G. VENTILATION, ENCLOSED PROCESS)

LEAK AND SPILL PROCEDURE

EVACUATE AREA - ELIMINATE ALL SOURCES OF IGNITION - WEAR PROTECTIVE CLOTHING

=====

PROPANE

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FOR CLEANUP.
WASTE DISPOSAL
NOT AVAILABLE
HANDLING PROCEDURES AND EQUIPMENT
HANDLE AND OPEN CONTAINERS WITH CARE.
STORAGE REQUIREMENTS
STORE IN COOL WELL VENTILATED AREA. KEEP AWAY FROM STRONG OXIDIZING
MATERIAL AND SOURCES OF IGNITION.
SPECIAL SHIPPING INFORMATION
STORE AND LOAD AT NORMAL TEMPERATURE (UP TO 38 C) AND AT ATMOSPHERIC
PRESSURE

=====

8. REACTIVITY DATA

=====

CHEMICAL STABILITY IF NO, UNDER
YES [X] NO [] WHICH CONDITIONS?

INCOMPATIBILITY WITH OTHER SUBSTANCES
YES [X] NO [] IF SO, MAY REACT WITH STRONG OXIDIZING MATERIALS
WHICH ONES?

REACTIVITY, AND UNDER WHAT CONDITIONS

HAZARDOUS DECOMPOSITION PRODUCTS
NORMAL COMBUSTION FORMS CARBON DIOXIDE AND WATER VAPOR. INCOMPLETE
COMBUSTION CAN PRODUCE CARBON MONOXIDE.

=====

9. PREPARATION

=====

PREPARED BY: IRVING OIL LIMITED, DATE: FEB. 18, 1997
SAINT JOHN, N.B.
(506) 632-2000

=====

Cette fiche signalétique est aussi disponible en français

=====

QUICKLIME

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* * * * *
* M S D S *
*
* Canadian Centre for Occupational Health and Safety *
* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2265230
PRODUCT NAME(S) : High-Calcium Quicklime
Calcium Oxide, Quicklime
DATE OF MSDS : 2000-01-06

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Beachville Lime Limited
ADDRESS : Oxford County Road 6
Ingersoll Ontario
Canada N5C 3K5
EMERGENCY TELEPHONE NO. : 519-423-6283

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : Beachville Lime Limited
ADDRESS : Oxford County Road 6
Ingersoll Ontario
Canada N5C 3K5
EMERGENCY TELEPHONE NO. : 519-423-6283

*** MATERIAL SAFETY DATA ***

MATERIAL SAFETY DATA SHEET

SEC. I: MATERIAL IDENTIFICATION

MATERIAL: High-Calcium Quicklime
SYNONYMS: Calcium Oxide, Quicklime
MANUFACTURER: Beachville Lime Limited
Oxford County Road 6
Ingersoll, Ontario, N5C 3K5
Emergency Tel. No.: 519-423-6283
SUPPLIER: Same as Manufacturer
CHEMICAL NAME: Calcium Oxide
FORMULA: CaO
HAZARD CLASSIFICATION: Class E: Corrosive Substance

=====

QUICKLIME

=====

SEC. II: HAZARDOUS INGREDIENTS

INGREDIENT	% BY WT.	C.A.S. NO.	EXPOSURE LIMITS	LD50/LC50
Calcium Oxide	98	1305-78-8	2 mg/cu.m TWAEV	No published data

SEC. III: PHYSICAL DATA

PHYSICAL STATE:	Solid	ODOUR & APPEARANCE:	Odourless, white lumps or powder
SPECIFIC GRAVITY:	3.35	pH:	12.45 (Saturated Solution) at 25.0'C
MELTING PT. 'C:	2580	BOILING PT. 'C:	2850
VAPOUR PRESSURE:	Non-volatile		
COEFFICIENT OF WATER/OIL DISTRIBUTION:			Greater than 1

SEC. IV: FIRE AND EXPLOSION HAZARD

FIRE:	Non-flammable, non-combustible	EXPLOSION:	Non-explosive
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SEC. V: REACTIVITY

STABILITY:	Stable.
INCOMPATIBLE MATERIALS:	Water, Acids, Boric Oxide, Phosphorus Pentoxide.
REACTIVITY:	Reacts with liquid water to expand and produce heat; could burst containers or ignite combustible substances in contact.
HAZARDOUS DECOMPOSITION PRODUCTS:	None.

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QUICKLIME

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SEC. VI: TOXICOLOGICAL PROPERTIES

ROUTE OF ENTRY: Skin Contact, Eye Contact, Inhalation of Dust, and Ingestion are potential routes of entry.

EFFECTS OF ACUTE EXPOSURE: Irritation or burns to skin, nose, throat, and mucous membranes, sneezing, lacrimation. Coarse particles in eyes can cause serious burns. Burning sensation in mouth and stomach if sufficient ingested.

EFFECTS OF CHRONIC EXPOSURE: Drying or cracking of skin, blinking of eye.

EXPOSURE LIMITS: TWAEV - 2 mg/cu.m

IRRITANCY: Irritates skin, eye, mucous membranes.

SENSITIZATION: None reported.

SYNERGISTIC MATERIALS: None.

OTHER: No reported Carcinogenicity, Reproductive Effects, Teratogenicity or Mutagenicity.

SEC. VII: PREVENTATIVE MEASURES

PROTECTIVE EQUIPMENT: Long-sleeved shirt, long pants extending over tops of work boots. Gauntlet-type work gloves. Eye goggles, Lightweight face mask.

ENGINEERING CONTROLS: Provide mechanical ventilation in dusty areas.

LEAK AND SPILL PROCEDURES: Substantial spills into streams or ponds should be contained and neutralized with acid. Normal clean-up for spills on land.

WASTE DISPOSAL: Dispose in secure landfill.

HANDLING, STORAGE & SHIPPING: No special handling equipment. Minimize production of dust. Keep product dry in storage and shipping.

SEC. VIII: FIRST AID MEASURES

INHALATION: Remove from exposure.

INGESTION: Drink plenty of water, fruit juice, or a mixture of 1 part vinegar in 2 parts water.

EYE: Flush immediately with plenty of water and get medical attention.

SKIN: Wash affected area with plenty of water.

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QUICKLIME

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PREPARATION OF MSDS:

Prepared By:-----Brenda Doucette-Carter----- Date: January 6, 2000

The information is, to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty or guarantee is made to its accuracy, reliability or completeness. It is the user's responsibility to review this information, satisfy themselves as to its suitability and completeness, and pass on the information to its employees or customers. Beachville Lime Limited does not accept responsibility for any loss or damage which may occur from the use of this information.

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SODIUM CYANIDE

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2437760

PRODUCT NAME(S) : Cyanide of Sodium
Prussiate of Soda
Sodium Cyanide

PRODUCT IDENTIFICATION : MSDS NUMBER: CEC00007

DATE OF MSDS : 2000-05-25

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-10-30

*** MANUFACTURER INFORMATION ***

MANUFACTURER : DuPont Canada, Inc

ADDRESS : Post Office Box 2200
Streetsville
Mississauga Ontario
Canada L5M 2H3
Telephone: 800-387-2122 (Product
Information)

EMERGENCY TELEPHONE NO. : 613-348-3616 (Transport, 24 HOURS)
613-348-3616 (Medical, 24 HOURS)

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : DuPont Canada, Inc

ADDRESS : Post Office Box 2200
Streetsville
Mississauga Ontario
Canada L5M 2H3
Telephone: 800-387-2122 (Product
Information)

EMERGENCY TELEPHONE NO. : 613-348-3616 (Transport, 24 HOURS)
613-348-3616 (Medical, 24 HOURS)

*** MATERIAL SAFETY DATA ***

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SODIUM CYANIDE

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CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

"Cyanobrick", "Cyanogran" are registered trademarks of DuPont.

Corporate MSDS Number : DU000290
CAS Number : 143-33-9
Formula : NaCN
CAS Name : SODIUM CYANIDE
Grade : "CYANOBRIK"; "CYANOGRAN"

Product Use

Ore leaching and flotation

Tradenames and Synonyms

Cyanide of Sodium
Prussiate of Soda

Company Identification

MANUFACTURER/DISTRIBUTOR

DuPont Canada, Inc.
P.O. Box 2200
Streetsville
Mississauga, Ontario L5M 2H3

PHONE NUMBERS

Product Information : 1-800-387-2122
Transport Emergency : 1-613-348-3616 (24 HOURS)
Medical Emergency : 1-613-348-3616 (24 HOURS)

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
*SODIUM CYANIDE	143-33-9	>96 WT%
OTHER SODIUM SALTS		<4 WT%

* Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

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SODIUM CYANIDE

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HAZARDS IDENTIFICATION

Potential Health Effects

May be fatal if inhaled, swallowed, or absorbed through the skin. Contact with acids or weak alkalies liberates poisonous gas. May cause eye burns and skin irritation and rashes. May cause rapid respirations and pulse, reddened eyes, flushed skin, weakness, headache, dizziness, confusion, nausea and vomiting. These may be followed by unconsciousness, convulsions, cessation of breathing, loss of blood pressure, heart beat irregularities, dilation of pupils and death. The lungs may fill with liquid.

SODIUM CYANIDE:

Skin contact with Sodium cyanide may cause skin irritation with discomfort or rash; strong solutions may cause skin burns or ulceration. Evidence suggests that significant skin permeation can occur. There are no reports of human sensitization.

Eye contact with Sodium cyanide may cause eye irritation with discomfort, tearing, or blurred vision. Prolonged exposure may cause eye corrosion with corneal or conjunctival ulceration.

Inhalation, ingestion or skin contact of Sodium cyanide may cause nonspecific discomfort such as:

Reddening of the eyes	Nausea
Irritation of the throat	Headache
Palpitation	Weakness of arms and legs
Difficulty in breathing	Giddiness
Salivation	Collapse
Numbness	Convulsions

Central nervous system stimulation followed by central nervous system depression may occur with hypoxic convulsions and death due to respiratory arrest.

Higher exposures may lead to rapid respiration and pulse, flushing, cyanosis, acidosis, thyroid effects sometimes observed in individuals with nutritional deficiencies symptoms associated with Parkinsonian Syndrome; or pulmonary edema and fatality from gross overexposure. In the few cases of disturbance of vision or damage to the optic nerve or retina attributable to cyanide poisoning, the poisoning has been acute and severe, and lethal or near lethal. There are reports of increased incidence of insomnia, agitated sleep, tremors, dermatitis and nose bleed in electroplating workers.

Individuals with preexisting diseases of the central nervous system may have increased susceptibility to the toxicity of

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SODIUM CYANIDE

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excessive exposures.

Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

FIRST AID MEASURES

Compound-Specific First Aid & Notes to Physicians

A step-wise procedure of "First Aid" and "Medical Treatment" is recommended for any cyanide poisoning. Treatment requires immediate action to prevent harm or death. First Aid is given initially, and experience shows that when given promptly it is usually the only treatment needed for typical accidental poisonings. Medical treatment may be needed for more severe poisoning.

First aid treatment uses oxygen and amyl nitrite and can be given by a first responder before medical help arrives.

Medical treatment is given if the patient does not respond to First Aid. Medical Treatment is a more aggressive treatment requiring intravenous injections of sodium nitrite and sodium thiosulfate, and must be administered by qualified medical personnel. It provides a larger quantity of antidote which helps eliminate cyanide from the body. Even if a doctor or nurse is present, the need for fast treatment dictates using the First Aid procedure with oxygen and amyl nitrite while Medical Treatment materials for intravenous injection are being prepared. When antidotal treatment is necessary, it should be started immediately.

IN CASE OF CYANIDE POISONING, START FIRST AID TREATMENT IMMEDIATELY, THEN CALL A PHYSICIAN.

In most cases, cyanide poisoning causes a deceptively healthy pink to red skin color. However, if a physical injury or lack of oxygen is involved, the skin color may be bluish. Reddening of the eyes and pupil dilation are also symptoms of cyanide poisoning. Cyanosis (blue discoloration of the skin) tends to be associated with severe cyanide poisonings whereas red coloration

of the skin is more common in industrial accidents that involve less cyanide.

All persons with the potential for cyanide poisoning should be trained to provide immediate First Aid using oxygen and amyl nitrite. Always have on hand the materials listed below in the FIRST AID and MEDICAL TREATMENT Sections. Actions to be taken in case of cyanide poisoning should be planned and practiced before beginning work with cyanides. Identification of community

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SODIUM CYANIDE

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hospital resources and emergency medical squads in order to equip and train them on handling of cyanide emergencies is essential.

FIRST AID SUPPLIES

Adequate First Aid supplies for cyanide poisoning should be conveniently placed throughout the cyanide areas and should be immediately accessible at all times, but secured against tampering or theft. Supplies should be routinely inspected (typically daily) by people who would use them in an emergency. The total number of each item listed below should be adequate to handle the largest number of exposure cases reasonably anticipated, taking into account that some supplies may be wasted, destroyed, or inaccessible in the emergency.

1. Oxygen Resuscitators - Any positive pressure resuscitator capable of giving oxygen in conjunction with amyl nitrite can be used.

2. Amyl Nitrite Ampoules (antidote) - One box of one dozen ampoules per station is usually satisfactory. Locate stations throughout the cyanide area.

CAUTION: Amyl nitrite is not stable and must be replaced every 1-2 years, or earlier depending on storage conditions. Store in the original dated box away from heat and freezing temperatures. Do not store amyl nitrite or Medical Treatment Kits (see below) in enclosed areas where temperatures can exceed 60-66 deg C (140-150 deg F) or where freezing may occur. Storage in high temperature climates may require replacement before the expiration date, unless cool storage is provided. Avoid excessive cold storage which will reduce the vapor pressure of amyl nitrite and, hence, its effectiveness. A common DuPont practice is to use the resuscitator as the storage point for the amyl nitrite ampoules.

3. A set of cyanide first aid instructions should be located at each amyl nitrite storage location. Workers should be fully trained since in a real emergency there will be insufficient time to "read the book".

Amyl Nitrite Notes:

1. Amyl nitrite is highly volatile and flammable; do not smoke or use around a source of ignition.

2. If treating a patient in a windy or drafty area, provide something--a rag, shirt, wall, drum, cupped hand, etc.--to prevent the amyl nitrite vapors from being blown away. Keep the ampoule upwind from the nose. The objective is to get amyl nitrite into the patient's lungs.

3. Rescuers should avoid amyl nitrite inhalation to avoid becoming dizzy and losing competence.

4. Lay the patient down. Since amyl nitrite dilates blood vessels and lowers blood pressure, laying the patient down will help prevent unconsciousness.

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SODIUM CYANIDE

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5. Do not overuse. Monitor the patient for shock which would indicate excessive use. This has not occurred in practice at DuPont plants, and we are not aware of any serious after effects

from treatment with amyl nitrite.

6. Review and adhere to proper storage, inspection and replacement requirements given above.

FIRST AID PROCEDURE

The exposed person should be removed from the contaminated area, contaminated clothing removed and the individual washed off. The rescuer and/or person providing first aid is subject to exposure if the affected person's clothing is wetted with cyanide. For HYDROGEN CYANIDE, rescue of a wetted person should be done wearing self-contained breathing air (SCBA), rubber gloves, and other personal protective equipment as necessary. For SODIUM CYANIDE or POTASSIUM CYANIDE dusts or solutions, SCBA is normally not needed. Contact with HYDROGEN CYANIDE must be avoided by rescuers, but short contact from solid cyanide or solutions is normally not a problem if skin washing is prompt. As soon as possible, even while clothing is being removed or washing is taking place, First Aid should be started.

1. If no symptoms are evident, no treatment is necessary; decontaminate patient.
2. If conscious but symptoms (nausea, difficult breathing, dizziness, etc.) are evident, give oxygen.
3. If consciousness is impaired (non-responsiveness, slurred speech, confusion, drowsiness) or the patient is unconscious but breathing, give oxygen and amyl nitrite by means of a resuscitator.

To give amyl nitrite, break an ampoule in a gauze pad and insert into lip of the resuscitator mask for 15 seconds, then take away for fifteen seconds. Repeat 5-6 times. If necessary, use a fresh ampoule every 3 minutes until the patient regains consciousness (usually 1-4 ampoules). Administer oxygen continuously. Guard against the ampoule entering the patient's mouth.

4. If not breathing, give oxygen and amyl nitrite immediately by means of a positive pressure resuscitator (artificial respiration).

Administer amyl nitrite as discussed in #3 and continue to give oxygen simultaneously to aid recovery. If massive exposure occurred, consider keeping the first one or two ampoules in the lip of the resuscitator mask continuously. Guard against the ampoule entering the patient's mouth.

INHALATION

If consciousness is impaired, oxygen and amyl nitrite should be administered as indicated under First Aid Procedure. Carry the

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SODIUM CYANIDE

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patient to an uncontaminated atmosphere. Keep the patient warm and calm. Call a physician.

SKIN CONTACT

If consciousness is impaired, oxygen and amyl nitrite should be administered as indicated under First Aid Procedure. Immediately flush with large quantities of water for up to 5 minutes after contact or suspected contact, and completely remove all contaminated clothing (including shoes or boots). Flushing with water for up to 5 minutes is generally sufficient to effectively remove cyanide from the patient's skin. Call a physician.

EYE CONTACT

Immediately flush the eyes with large quantities of water for up to 5 minutes while holding the eyelids apart. Do not try to neutralize with "acids" or "alkalis". Eye contact will require further evaluation and possibly treatment. Continue rinsing the eye during transport to the hospital. See a physician. Oxygen and amyl nitrite should be used as indicated above.

INGESTION

If the patient is conscious, immediately have patient spit and rinse mouth with water then give patient activated charcoal slurry. If consciousness is impaired, or the patient is unconscious, immediately administer oxygen and amyl nitrite as discussed in the First Aid Procedure Section. Never give anything by mouth to an unconscious person. Give patient activated charcoal slurry ONLY when consciousness is regained. DO NOT give Syrup of Ipecac or other emetics since they will induce vomiting which could interfere with resuscitator use. Continue to give oxygen. Call a physician.

NOTE: To prepare activated charcoal slurry, mix 50 grams of activated charcoal in 400 mL (about 2 cups) water and mix thoroughly. Give 5 mL/kg, or 350 mL for an average adult.

MEDICAL TREATMENT

EXPERIENCE SHOWS THAT FIRST AID GIVEN PROMPTLY IS USUALLY THE ONLY TREATMENT NEEDED FOR TYPICAL INDUSTRIAL CYANIDE POISONING. LARGER CYANIDE POISONINGS INCREASE THE NEED FOR MEDICAL TREATMENT.

Do not over-react. Although prompt action is essential when poisoning has occurred, a lucid, conscious person who can communicate may not have significant cyanide poisoning and Medical Treatment will rarely be necessary. "Treat what you see" is a good rule of thumb. Mildly symptomatic patients who remain alert may be managed by supportive care only.

The half-life of cyanide in the body is about 20-90 minutes. In diagnosis and monitoring of patients, the critical period for treatment is short. Normally the effects from cyanide poisoning occur in the first few minutes and will indicate the degree of poisoning.

SODIUM CYANIDE

"Preventive" use of cyanide antidote in the absence of impaired consciousness is not normally warranted. Keep the patient calm by assurance over the next 30 minutes, and closely monitor the patient's condition. If skin contact with cyanide has been prolonged and/or extensive cyanide has been ingested, watch the individual closely for at least 30 minutes to assure there are no effects from delayed absorption of cyanide into the blood stream.

Consider assuring intravenous access in cases where significant toxicity is possible. Establishment of IV access with normal saline, Ringer's lactate, or other available IV fluid will facilitate administration of the antidote if necessary.

MEDICAL TREATMENT KITS

Medical Treatment Kits for cyanide poisoning should be conveniently located for easy access. Materials for intravenous injection are intended for use only by a physician or fully qualified medical personnel. The location of kits should be carefully planned as part of the emergency program. Kits should always be taken with patient during transport to medical facilities to ensure availability. Suggested locations for kits include:

- o in or near the cyanide area
- o plant medical station
- o guard house entrance
- o local hospital
- o doctor's office and residence

CAUTION: Avoid storing amyl nitrite or Medical Treatment Kits in areas subject to extreme heat or freezing conditions. Kits and amyl nitrite should be accessible but secured against tampering. They should be inspected regularly and the amyl nitrite ampoules replaced every 1-2 years (See First Aid Supplies Section). Medical Treatment Kits should contain the following:

1. One box containing one dozen (12) amyl nitrite ampoules.
2. Two sterile ampoules of sodium nitrite solution (10 mL of a 3% solution in each).
3. Two sterile ampoules of sodium thiosulfate solution (50 mL of a 25% solution in each).
4. One 10 mL sterile syringe. One 50 mL sterile syringe. Two sterile intravenous needles. One tourniquet.
5. One dozen gauze pads.
6. Latex gloves.

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SODIUM CYANIDE

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7. A "Biohazard" bag for disposal of bloody/contaminated equipment.
8. A set of cyanide instructions on first aid and medical treatment.

NOTE: Amyl nitrite ampoules and Medical Treatment Supplies can be purchased through local pharmacies with a physician's prescription.

MEDICAL TREATMENT PROCEDURE

1. Sodium nitrite: Adult - 10 mL of 3% solution (300 mg)
Draw solution from the ampoule and inject slowly over 4-5 minutes (2 to 2.5 mL/minute). As soon as practical, monitor blood pressure and continue checking pulse. Slow the rate of injection if hypotension (low blood pressure) occurs.

2. Sodium thiosulfate: Adult - 50 mL of 25% solution (12.5 grams)
Follow sodium nitrite with sodium thiosulfate injected at a rate of 2.5 mL/minute (10-20 minutes).

The total time for injection of these initial doses of both components at the recommended rates is lengthy, approximately 20-25 minutes.

Consider the body weight and condition of the patient when treating a cyanide exposed patient with sodium nitrite. Both amyl nitrite and sodium nitrite produce methemoglobin, which reduces the oxygen carrying capacity of the blood. Methemoglobinemia is potentially harmful when methemoglobin levels exceed 20-30% (See Antidotal Effects Section).

If symptoms persist or recur after the initial treatment, repeat the antidote at one half the original doses one hour after the original administration. Monitor methemoglobin levels when practical in every patient treated with the intravenous antidote.

AVOID OVER-TREATMENT.

The above sodium nitrite injection discussed in the Medical Treatment Procedure Section is about one-third the lethal dose, so care should be taken to avoid excessive use. It is not essential that full quantities of antidote be given just because treatment was started. Should injection be stopped for any reason, keep track of the amount administered in case treatment needs to be restarted.

ANTIDOTAL EFFECTS

Nitrites can produce hypotension through peripheral vasodilatation (widening of the blood vessels). Methemoglobin formation, although considered a therapeutic effect, may cause symptoms if levels exceed 20-30%. Recommended intravenous doses of sodium nitrite discussed in the Medical Treatment Procedure Section usually produce methemoglobin levels under 20%. Headache, nausea, vomiting, and syncope (fainting) may follow nitrite administration, and syncope may occur if the patient is not lying down. While it is important to be aware of the effects from

SODIUM CYANIDE

nitrite therapy, there have been no long-lasting effects associated with this treatment regimen for cyanide exposure in DuPont's experience and knowledge.

RECOVERY AND DISPOSITION

For most accidental poisonings, patients can be revived in a few minutes using oxygen and amyl nitrite with complete recovery within a few hours.

If necessary, the patient should be monitored for 24-48 hours. Any patient whose symptoms require the use of IV antidote should be considered for admittance to an intensive care unit.

Observe for return of symptoms. Monitor methemoglobin levels, blood pH and oxygenation through arterial blood gas analysis. Calculate anion gap from serum electrolytes. Cyanide poisoning causes lactate accumulation and an anion gap metabolic acidosis.

Delayed neurotoxic effects are not expected consequences of cyanide exposure although neurotoxic effects may occur if hypoxia (oxygen deficiency) was prolonged or occurred following massive cyanide exposure.

In the presence of smoke inhalation that can occur during fires, withholding amyl nitrite or sodium nitrite administration should be considered because of the potential for high carboxyhemoglobin levels. However, administration of oxygen and possibly sodium thiosulfate should be continued.

FIRE FIGHTING MEASURES

Flammable Properties

Will not burn.

Follow appropriate National Fire Protection Association (NFPA) codes.

Sodium Cyanide may not be completely destroyed in an ordinary fire involving combustible materials such as paper or wood. While sodium cyanide does not support combustion, it can oxidize in a fire.

Extinguishing Media

Use water on fires near cyanide but minimize the amount of water if containers are opened or burned to avoid cyanide runoff (see "Incompatibility with Other Materials" and "Fire Fighting Instructions"). DO NOT use carbon dioxide (CO₂) on wet cyanide where carbonic acid (H₂O + CO₂) could release cyanide.

SODIUM CYANIDE

Fire Fighting Instructions

Sodium Cyanide dissolves readily in water; therefore, cyanide solution runoff may occur if containers are opened or burned. Runoff should be contained to avoid environmental or safety problems. Contained cyanide solution can be detoxified with hypochlorite. In some cases it may be desirable to let a fire burn out by itself since sodium cyanide will not normally be affected by the fire.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Spill Clean Up

Shovel and sweep up spilled material into a covered container or plastic bag pending transfer. Cover and keep spillage dry. Flush spill area with a dilute solution of sodium hypochlorite or calcium hypochlorite to destroy the cyanide. Call DuPont for guidance. Comply with Federal, State, and local regulations reporting releases. The EPA Reportable Quantity (RQ) is 10 pounds.

HANDLING AND STORAGE

Handling (Personnel)

Emergency planning and training are needed before beginning work with cyanide since prompt treatment is essential in cases of cyanide poisoning. Always have Cyanide Antidote Kits on hand. Do not breathe dust, mist, or cyanide gas. Do not get in eyes. Avoid contact with skin and clothing. Do not carry foodstuffs, beverages, or tobacco where contamination with cyanide is possible. Wash thoroughly after handling. Wash contaminated clothing before reuse.

Storage

Store in properly labeled containers in dry, ventilated, secured areas. Keep containers closed and contents dry. Do not store with acids or acid salts, containers with water or weak alkalis, or oxidizing agents. Do not handle or store food, beverages, or tobacco in cyanide areas. Do not store near combustibles or flammables because subsequent fire

SODIUM CYANIDE

fighting with water could lead to cyanide solution runoff.
If legal, do not store under sprinkler systems.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Use sufficient ventilation to keep employee exposure below recommended limits.

Personal Protective Equipment

Recommended minimum protection: Chemical splash goggles and rubber gloves (butyl or neoprene preferred).

Have available and use as appropriate: face shield; rubber suits, aprons, and boots; NIOSH approved disposable air purifying respirator with appropriate particulate filter; self-contained breathing air supply (in case of emergency); hydrogen cyanide detector; First Aid and Medical Treatment supplies, including oxygen resuscitators.

Exposure Guidelines

Exposure Limits

Sodium Cyanide

PEL (OSHA)	: 5 mg/m ³ , as CN, 8 Hr. TWA, Skin
TLV (ACGIH)	: Ceiling 5 mg/m ³ , as CN, Skin
AEL * (DuPont)	: 5 mg/m ³ , 15 minute TWA, as CN, Skin

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

Exposure Guideline Comments

The "Skin" notation in the Exposure Limits Section indicates that liquid or vapor may penetrate the skin (especially if the skin is broken). Control of vapor, dust, and mist inhalation alone may not be sufficient to prevent an excessive dose.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

SODIUM CYANIDE

Boiling Point : 1496 C (2725 F) @ 760 mm Hg
Vapor Pressure : Negligible
Vapor Density : Nil
Melting Point : 564 C (1047 F)
Solubility in Water : 37 WT% @ 20 C (68 F)
pH : 11-12

The pH listed above is typical for 5-25 % solutions with no pH adjustment.

Form : Solid, Granular, Briquettes.
Color : White.
Specific Gravity : 1.6
Bulk Density (Packed) : 50-55 lb/cu ft

Solid cyanide has no odor, but it can have a slight ammonia and/or hydrogen cyanide odor if damp.

STABILITY AND REACTIVITY

Chemical Stability

Very stable when dry.

Incompatibility with Other Materials

Large amounts of poisonous, flammable hydrogen cyanide (HCN) gas will be evolved from contact with acids. Reacts violently with strong oxidizing agents when heated. Water or weak alkaline solutions can produce dangerous amounts of hydrogen cyanide in confined areas.

Decomposition

Moisture will cause slow decomposition, releasing poisonous hydrogen cyanide and ammonia gases.

Polymerization

Polymerization will not occur.

TOXICOLOGICAL INFORMATION

SODIUM CYANIDE

Animal Data

SODIUM CYANIDE:

Oral LD50: 15 mg/kg in rats
Dermal LD50: 11.28-14.63 mg/kg in rabbits
Inhalation LC50: no information found but considered to
be highly toxic as CN by inhalation

Solid Sodium cyanide has not been tested for skin and eye irritation, or for skin sensitization.

NOTE: Administration of Sodium cyanide to rats, cats, or dogs by the intravenous or intraperitoneal routes resulted in rapid respiration, confusion, unconsciousness, vomiting, decreased blood pressure, cardiac rate changes, seizures and respiratory failure.

Eye: As with other routes of exposure, systemic toxicity and death is possible from contamination of the eye; LD50 dose in rabbits is approximately 5 mg/kg.

Sodium cyanide applied to the skin of rabbits produced tremors, retrocolic spasms, convulsions, abnormal breathing patterns, and prostration.

Ingestion: Repeated administration of cassava diets containing unspecified cyanide ion caused decreased thyroid activity and kidney changes. Long-term administration of 0.5, 1.0, or 2.0 mg/kg/day to dogs produced unspecified acute intoxication symptoms and increased numbers of red blood cells and decreased proteins were observed at doses greater than 1.0 mg/kg/day. Central nervous system changes occurred in all treated dogs.

No animal test reports are available to define carcinogenic hazards of Sodium cyanide. Limited reproductive studies do not suggest effects. Some tests have shown the potential for developmental toxicity but only at exposure levels producing toxic effects in the adult animal.

Sodium cyanide does not produce genetic damage in bacterial cell cultures, and has not been tested in animals.

ECOLOGICAL INFORMATION

Ecotoxicological Information

AQUATIC TOXICITY:

96 hour LC50 - Fathead minnows: 0.43-0.66 mg/L.

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SODIUM CYANIDE

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Extremely toxic.

DISPOSAL CONSIDERATIONS

Waste Disposal

This material may be a RCRA Hazardous waste. Do not flush cyanide into sewers which may contain an acid. Detoxify with dilute sodium hypochlorite, hydrogen peroxide, or calcium hypochlorite. Comply with Federal, State, and local regulations on disposal methods used to achieve the constituent based treatment standard, if permitted; or transfer to a licensed disposal contractor.

TRANSPORTATION INFORMATION

Shipping Information

DOT
Proper Shipping Name : SODIUM CYANIDE
Hazard Class : 6.1
I.D. No. (UN/NA) : UN1689
DOT Label(s) : TOXIC
Special Information : MARINE POLLUTANT
Packing Group : I

DOT/IMO
Proper Shipping Name : SODIUM CYANIDE, SOLID
Hazard Class : 6.1
UN No. : 1689
DOT/IMO Label : TOXIC
Special Information : MARINE POLLUTANT
Packing Group : I

Reportable Quantity : 10 lb (4.54 kg)

Shipping Containers

Steel Drums : 50 kg, 100 kg

"CYANO-DOL" Railcars and Trucks
Excel I and Excel II Trucks
Hopper Railcars
"FLO-BINS" (3,000 lb. net; 3,600 lb. gross)
Bag in a Box (1,000 kg./2,200 lb.)

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SODIUM CYANIDE

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Tuff Paks: 48, 20 kg bags in a box (960 kg or 2112 lbs).

Shipping Information -- Canada

TDG
Proper Shipping Name : SODIUM CYANIDE SOLID
PIN No. : UN 1689
TDG Class : 6.1 (9.2)
TDG Packing Group : I

REGULATORY INFORMATION

U.S. Federal Regulations

TSCA Inventory Status : Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes
Chronic : No
Fire : No
Reactivity : Yes
Pressure : No

HAZARDOUS CHEMICAL LISTS

SARA Extremely Hazardous Substance: Yes
CERCLA Hazardous Substance : Yes
SARA Toxic Chemical : Yes

Canadian Regulations

WHMIS Classification:

CLASS D Division 1 Subdivision A - Very Toxic Material/Acute
Lethality.

CLASS D Division 2 Subdivision B - Toxic Material. Skin or Eye
Irritant.

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

OTHER INFORMATION

NFPA, NPCA-HMIS

NFPA Rating
Health : 3
Flammability : 0
Reactivity : 1

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SODIUM CYANIDE

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NPCA-HMIS Rating

Health : 3
Flammability : 0
Reactivity : 1

Personal Protection rating to be supplied by user depending on use conditions.

Additional Information

For further information, see DuPont Cyanide Storage and Handling Bulletin.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS

CHEMICALS
DuPont Canada Inc.
7070 Mississauga Rd.
Mississauga, Ontario, L5M 2H3
(905) 821-5369.

Indicates updated section.

End of MSDS

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SODIUM SULPHATE

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2428877

PRODUCT NAME(S) : SODIUM SULPHATE

DATE OF MSDS : 1998-02-16

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-09-27

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : CANADA COLORS AND CHEMICALS LIMITED

ADDRESS : 80 Scarsdale Road
Don Mills Ontario
Canada M3B 2R7
Telephone: 416-449-7750

EMERGENCY TELEPHONE NO. : 416-444-2112

SUPPLIER/DISTRIBUTOR NOTE :

For further information about this product please contact the Canada
Colors Customer Service Department at 416-449-7750.

*** MATERIAL SAFETY DATA ***

MATERIAL SAFETY DATA SHEET : 00001598

CANADA COLORS AND CHEMICALS LI
80 SCARSDALE ROAD
DON MILLS, ONTARIO M3B 2R7
(416) 449-7750

Product: SODIUM SULPHATE

SECTION 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER..... SASKATCHEWAN MINERALS
P.O. BOX 120
CHAPLIN, SASKATCHEWAN
CANADA
S0H 0V0

PRODUCT NAME.....

PRODUCT CODE.....

CHEMICAL FORMULA..... Na₂SO₄.

MOLECULAR WEIGHT..... 142.04.

CHEMICAL FAMILY..... INORGANIC.

MATERIAL USE..... REFER TO TECHNICAL LITERATURE.

EMERGENCY PHONE NO..... (416)-444-2112.

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SODIUM SULPHATE

=====

SECTION 02: COMPOSITION/INFORMATION ON INGREDIENTS

% CAS / TLV LD/50, ROUTE, SPECIES LC/50, ROUTE, SPECIES

*NONE

SECTION 03: HAZARDS IDENTIFICATION

ROUTE OF ENTRY:.....

SKIN CONTACT..... MILD IRRITANT.

SKIN ABSORPTION..... N.AV.

EYE CONTACT..... IRRITANT.

INHALATION..... CAUSES IRRITATION OF THE RESPIRATORY TRACT.

INGESTION..... SLOWLY ABSORBED FROM THE ALIMENTARY TRACT.

BECAUSE OF OSMOTIC ACTIVITY, IT WILL DRAW

WATER INTO THE LUMEN OF THE BOWEL AND, IN

SUFFICIENT QUANTITY, MAY CAUSE PURGING AND

FLUID LOSS.

EFFECTS OF ACUTE EXPOSURE..... DUST OR VAPORS MAY BE IRRITATING TO SKIN,

EYES, AND RESPIRATORY TRACT.

EFFECTS OF CHRONIC EXPOSURE..... NO RELEVANT INFORMATION FOUND.

INHALATION, CHRONIC..... N.AV.

SECTION 04: FIRST AID MEASURES

INSTRUCTIONS:..... FLUSH EYES WITH LARGE AMOUNTS OF RUNNING

WATER FOR AT LEAST 15 MINUTES. HOLD

EYELIDS APART TO ENSURE RINSING OF THE

ENTIRE SURFACE OF THE EYE AND LIDS WITH

WATER.FLUSH CONTAMINATED SKIN WITH PLENTY

OF WATER.IN CASE OF INHALATION, REMOVE TO

FRESH AIR.IN CASE OF INGESTION, GIVE LARGE

QUANTITIES OF WATER IF CONSCIOUS.CONSULT A

PHYSICIAN.

SECTION 05: FIRE FIGHTING MEASURES

T.D.G. FLAM. CLASS.....

FLAMMABILITY..... NOT FLAMMABLE.

IF YES, UNDER WHICH.....

CONDITIONS?

EXTINGUISHING MEDIA..... CARBON DIOXIDE, DRY CHEMICAL, ALCOHOL

FOAM, WATER FOG. WATER FOG.

SPECIAL PROCEDURES..... FIREFIGHTERS SHOULD WEAR SELF-CONTAINED

BREATHING APPARATUS.

FLASH POINT (C), METHOD..... N.AV.

SODIUM SULPHATE	
AUTO IGNITION TEMPERATURE.....	N.AV.
UPPER FLAMMABLE LIMIT (% BY.....	N.AV.
VOL.)	
LOWER FLAMMABLE LIMIT (% BY.....	N.AV.
VOL.)	
EXPLOSION DATA.....	
EXPLOSIVE POWER.....	N.AV.
RATE OF BURNING.....	N.AV.
SENSITIVITY TO STATIC.....	N.AV.
DISCHARGE	
SENSITIVITY TO IMPACT.....	N.AV.
HAZARDOUS COMBUSTION PRODUCTS.....	BURNING CAN PRODUCE,, OXIDES OF SODIUM.

SECTION 06: ACCIDENTAL RELEASE MEASURES

LEAK/SPILL..... COLLECT AND CONTAIN IN SUITABLE DISPOSAL
CONTAINERS.

SECTION 07: HANDLING AND STORAGE

HANDLING PROCEDURES AND.....	AVOID ALL SKIN CONTACT.AVOID GETTING IN EYES.USE ADEQUATE VENTILATION.KEEP CONTAINERS CLOSED OR SEALED.MAINTAIN A GOOD PERSONAL HYGIENE.
EQUIPMENT	
STORAGE NEEDS.....	KEEP THE CONTAINER TIGHTLY CLOSED WHEN NOT IN USE.STORE AWAY FROM INCOMPATIBLE MATERIALS.STORE IN A COOL AND WELL-VENTILATED AREA.

SECTION 08: EXPOSURE CONTROLS/PERSONAL PROTECTION

GLOVES/ TYPE.....	RUBBER.
RESPIRATORY/TYPE.....	USE NIOSH OR MSHA APPROVED SELF-CONTAINED BREATHING APPARATUS IN HIGH CONCENTRATIONS.
EYE/TYPE.....	SAFETY GLASSES. GOGGLES.
FOOTWEAR/TYPE.....	BOOTS.
CLOTHING/TYPE.....	WEAR IMPERVIOUS PROTECTIVE CLOTHING.
OTHER/TYPE.....	N.AV.
ENGINEERING CONTROLS.....	VENTILATE ADEQUATELY.

SODIUM SULPHATE

SECTION 09: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE.....	SOLID.
ODOUR.....	NO ODOUR.
ODOUR THRESHOLD.....	N.AV.
VAPOUR PRESSURE (MMHG).....	N.AP.
VAPOUR DENSITY (AIR=1).....	N.AP.
EVAPORATION RATE.....	N.AP.
BOILING POINT.....	1100 (C). DECOMPOSES.
PH.....	8.3.
SPECIFIC GRAVITY (WATER=1).....	2.7.
SOLUBILITY IN WATER (% W/W).....	15.9.
COEFFICIENT OF WATER/OIL DIST.....	N.AV.

SECTION 10: STABILITY AND REACTIVITY

```

CHEMICAL STABILITY:.....
    YES..... YES.
    NO, WHICH CONDITIONS?.....
COMPATABILITY WITH OTHER.....
SUBSTANCES:
    YES.....
    NO, WHICH ONES?..... ALUMINUM.
REACTIVITY CONDITIONS?..... VIOLENT EXPLOSIONS WILL OCCUR WHEN SODIUM
                                SULPHATE IS MELTED WITH ALUMINUM OR
                                MAGNESIUM.
HAZARDOUS PRODUCTS OF..... SEE HAZARDOUS COMBUSTION PRODUCTS.
DECOMPOSITION

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SECTION 11: TOXICOLOGICAL INFORMATION

EXPOSURE LIMIT OF MATERIAL.....	SEE SECTION 02.
LC 50 OF MATERIAL, SPECIES &.....	N.AV.
ROUTE	
LD 50 OF MATERIAL, SPECIES &.....	5989 MG/KG. (ORAL-MOUSE).
ROUTE	
CARCINOGENICITY OF MATERIAL.....	NONE.
TERATOGENICITY:.....	SODIUM SULPHATE IS NOT INCLUDED ON THE IARC, NTP, ACGIH LISTS OR ON NIOSH'S SUBFILE.
REPRODUCTIVE EFFECTS.....	CITED IN RTECS FROM INJECTABLE DOSES OF 60 MG/KG IN MICE.
IRRITANCY OF MATERIAL.....	SEE SECTION 03.
SENSITIZING CAPABILITY OF.....	N.AV.
MATERIAL	
SYNERGISTIC MATERIALS.....	NONE.

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SODIUM SULPHATE

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SECTION 12: ECOLOGICAL CONSIDERATIONS

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL..... IN ACCORDANCE WITH MUNICIPAL, PROVINCIAL
AND FEDERAL REGULATIONS.

SECTION 14: TRANSPORT INFORMATION

UN NUMBER..... N.AP.
TDG CLASSIFICATION..... NOT REGULATED.
PACKING GROUP..... N.AP.
SPECIAL SHIPPING INSTRUCTIONS..... N.AP.

SECTION 15: REGULATORY INFORMATION

WHMIS CLASSIFICATION..... THIS IS NOT A CONTROLLED PRODUCT.
CPR COMPLIANCE..... THIS PRODUCT HAS BEEN CLASSIFIED IN
ACCORDANCE WITH THE HAZARD CRITERIA OF THE
CPR AND THE MSDS CONTAINS ALL THE
INFORMATION
REQUIRED BY THE CPR.

SECTION 16: OTHER INFORMATION

N.AV.=NOT AVAILABLE.....
N.AP.=NOT APPLICABLE.....
PREPARED BY..... Regulatory Affairs
DATED..... 02161998

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VAR SOL

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* * * * *

* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2429254

PRODUCT NAME(S) : VAR SOL DX 3641

DATE OF MSDS : 1999-07-20

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-09-27

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : CANADA COLORS AND CHEMICALS LIMITED

ADDRESS : 80 Scarsdale Road
Don Mills Ontario
Canada M3B 2R7
Telephone: 416-449-7750

EMERGENCY TELEPHONE NO. : 416-444-2112

SUPPLIER/DISTRIBUTOR NOTE :

For further information about this product please contact the Canada
Colors Customer Service Department at 416-449-7750.

MATERIAL SAFETY DATA SHEET : 00004966

CANADA COLORS AND CHEMICALS LI
80 SCARSDALE ROAD
DON MILLS, ONTARIO M3B 2R7
(416) 449-7750

Product: VAR SOL DX 3641

SECTION 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER..... VAN WATERS & ROGERS LTD.
9800 VAN HORNE WAY
RICHMOND, B.C.
CANADA
V6X 1W5

PRODUCT NAME:.....

PRODUCT CODE:.....

CHEMICAL FORMULA..... N.AV.

MOLECULAR WEIGHT..... N.AV.

CHEMICAL FAMILY..... N.AV.

MATERIAL USE..... REFER TO TECHNICAL LITERATURE.

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VAR SOL

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EMERGENCY PHONE NO..... (416)-444-2112.

SECTION 02: COMPOSITION/INFORMATION ON INGREDIENTS

%	CAS / TLV	LD/50, ROUTE, SPECIES	LC/50, ROUTE, SPECIES

NAPHTHA, HYDROTREATED LIGHT			
100	64742-47-8	5000 MG/KG (ORL-RAT)	N.AV.
	---	3000 MG/KG	
		(DERMAL-RABBIT)	

SECTION 03: HAZARDS IDENTIFICATION

ROUTE OF ENTRY:.....

SKIN CONTACT..... IRRITANT.

SKIN ABSORPTION..... N.AV.

EYE CONTACT..... IRRITANT.

INHALATION..... HARMFUL IF INHALED.

INGESTION..... HARMFUL IF SWALLOWED.

EFFECTS OF ACUTE EXPOSURE..... SEE ABOVE.

EFFECTS OF CHRONIC EXPOSURE..... NONE KNOWN.

SECTION 04: FIRST AID MEASURES

INSTRUCTIONS:..... IN CASE OF INHALATION, REMOVE TO FRESH AIR.GET IMMEDIATE MEDICAL ATTENTION.FLUSH EYES WITH LARGE AMOUNTS OF RUNNING WATER FOR AT LEAST 15 MINUTES. HOLD EYELIDS APART TO ENSURE RINSING OF THE ENTIRE SURFACE OF THE EYE AND LIDS WITH WATER.IN CASE OF SKIN CONTACT.WASH SKIN WITH LARGE AMOUNTS OF RUNNING WATER, AND SOAP IF AVAILABLE, FOR 15 MINUTES.IF IRRITATION PERSISTS, GET MEDICAL ATTENTION.WASH CLOTHING BEFORE REUSE.IN CASE OF INGESTION:. DO NOT INDUCE VOMITING.GET IMMEDIATE MEDICAL ATTENTION.DO NOT GIVE ANYTHING BY MOUTH TO A CONVULSING OR UNCONSCIOUS PERSON.

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VAR SOL

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SECTION 05: FIRE FIGHTING MEASURES

T.D.G. FLAM. CLASS..... NOT REGULATED.
FLAMMABILITY..... SEE FLASH POINT.
IF YES, UNDER WHICH.....
CONDITIONS?
EXTINGUISHING MEDIA..... CARBON DIOXIDE, DRY CHEMICAL, ALCOHOL
FOAM, WATER FOG. WATER SPRAY.
SPECIAL PROCEDURES..... DO NOT USE A JET OF WATER OR FOAM.WEAR
FULL PROTECTIVE EQUIPMENT INCLUDING A
SELF-CONTAINED BREATHING APPARATUS.USE
WATER-SPRAY TO KEEP CONTAINERS COOL.
FLASH POINT (C), METHOD..... 63.
AUTO IGNITION TEMPERATURE..... N.AV.
UPPER FLAMMABLE LIMIT (% BY..... 13 %.
VOL.)
LOWER FLAMMABLE LIMIT (% BY..... 2.1.
VOL.)
EXPLOSION DATA.....
EXPLOSIVE POWER..... N.AV.
RATE OF BURNING..... N.AV.
SENSITIVITY TO STATIC..... N.AV.
DISCHARGE
SENSITIVITY TO IMPACT..... N.AV.
UNUSUAL FIRE AND EXPLOSION..... NONE KNOWN.
HAZARDS
HAZARDOUS COMBUSTION PRODUCTS..... N.AV.

SECTION 06: ACCIDENTAL RELEASE MEASURES

LEAK/SPILL..... COMBUSTIBLE LIQUID.KEEP AWAY FROM HEAT OR
FLAME. ABSORB WITH AN INERT MATERIAL SUCH
AS SAND, SOIL OR VERMICULITE; SWEEP UP AND
DISPOSE OF IN ACCORDANCE TO ALL GOVERNMENT
REGULATIONS. ELIMINATE IGNITION
SOURCES.SCOOP UP USED ABSORBENT INTO
DRUMS.PREVENT RUNOFF INTO DRAINS, SEWERS,
AND OTHER WATERWAYS.REPORT AS PER
REGULATORY REQUIREMENTS.

SECTION 07: HANDLING AND STORAGE

HANDLING PROCEDURES AND..... KEEP CONTAINERS CLOSED WHEN NOT IN
EQUIPMENT USE.AVOID CONTACT WITH EYES, SKIN, AND
CLOTHING.WASH THOROUGHLY AFTER HANDLING.
STORAGE NEEDS..... STORE IN A COOL, DRY, WELL VENTILATED
AREA, AWAY FROM HEAT AND IGNITION
SOURCES.STORE AWAY FROM INCOMPATIBLE
MATERIALS.KEEP THE CONTAINER TIGHTLY

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VAR SOL

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CLOSED WHEN NOT IN USE.

SECTION 08: EXPOSURE CONTROLS/PERSONAL PROTECTION

GLOVES/ TYPE..... WEAR IMPERVIOUS GLOVES.
RESPIRATORY/TYPE..... ATMOSPHERIC LEVELS SHOULD BE MAINTAINED
BELOW THE EXPOSURE GUIDELINE. WHEN
RESPIRATORY PROTECTION IS REQUIRED FOR
CERTAIN OPERATIONS, USE AN NIOSH APPROVED
AIR-PURIFYING RESPIRATOR.
EYE/TYPE..... CHEMICAL SAFETY GOGGLES.
FOOTWEAR/TYPE..... SAFETY SHOES.
CLOTHING/TYPE..... FULL COVER CLOTHING.
OTHER/TYPE..... EYE BATH AND SAFETY SHOWER.
ENGINEERING CONTROLS..... GENERAL (MECHANICAL) ROOM VENTILATION IS
EXPECTED TO BE SATISFACTORY.

SECTION 09: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE..... CLEAR. LIQUID.
ODOUR..... MILD ODOUR.
ODOUR THRESHOLD..... 200 PPM.
VAPOUR PRESSURE (MMHG)..... 0.75.
VAPOUR DENSITY (AIR=1)..... 5.4.
EVAPORATION RATE..... 0.1.
BOILING POINT..... 186 (C).
PH..... N.AV.
SPECIFIC GRAVITY (WATER=1)..... 0.79 (20(C)).
SOLUBILITY IN WATER (% W/W)..... INSOLUBLE.
COEFFICIENT OF WATER/OIL DIST..... N.AV.

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY:.....
YES..... YES.
NO, WHICH CONDITIONS?.....
COMPATABILITY WITH OTHER.....
SUBSTANCES:
YES.....
NO, WHICH ONES?..... OXIDIZING AGENTS.
REACTIVITY CONDITIONS?..... AVOID EXCESSIVE HEAT, OPEN FLAMES AND ALL
IGNITION SOURCES.
HAZARDOUS PRODUCTS OF..... NONE KNOWN.
DECOMPOSITION
HAZARDOUS POLYMERIZATION..... WILL NOT OCCUR.

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VAR SOL

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SECTION 11: TOXICOLOGICAL INFORMATION

EXPOSURE LIMIT OF MATERIAL..... NOT ESTABLISHED.
LC 50 OF MATERIAL, SPECIES &..... NONE FOUND.
ROUTE
LD 50 OF MATERIAL, SPECIES &..... N.AV.
ROUTE
CARCINOGENICITY OF MATERIAL..... N.AV.
REPRODUCTIVE EFFECTS..... N.AV.
IRRITANCY OF MATERIAL..... SEE SECTION 03.
SENSITIZING CAPABILITY OF..... N.AV.
MATERIAL
SYNERGISTIC MATERIALS..... N.AV.

SECTION 12: ECOLOGICAL CONSIDERATIONS

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL..... IN ACCORDANCE WITH MUNICIPAL, PROVINCIAL
AND FEDERAL REGULATIONS.

SECTION 14: TRANSPORT INFORMATION

UN NUMBER..... N.AP.
TDG CLASSIFICATION..... NOT REGULATED.
PACKING GROUP..... N.AP.
SPECIAL SHIPPING INSTRUCTIONS..... N.AP.

SECTION 15: REGULATORY INFORMATION

WHMIS CLASSIFICATION..... B3. D2B.
CPR COMPLIANCE..... THIS PRODUCT HAS BEEN CLASSIFIED IN
ACCORDANCE WITH THE HAZARD CRITERIA OF THE
CPR AND THE MSDS CONTAINS ALL THE
INFORMATION REQUIRED BY THE CPR.

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VAR SOL

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SECTION 16: OTHER INFORMATION

N.AV.=NOT AVAILABLE.....
N.AP.=NOT APPLICABLE.....
PREPARED BY..... Regulatory Affairs
DATED..... 07201999

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WINDSHIELD WASHER FLUID

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* * * * *

* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2487897

PRODUCT NAME(S) : WINDSHIELD WASHER FLUID

PRODUCT IDENTIFICATION : PRODUCT CODE R00072260000

DATE OF MSDS : 1999-06-29

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-12-18

*** MANUFACTURER INFORMATION ***

MANUFACTURER : SUN COMPANY, INC

ADDRESS : Ten Penn Center
1801 Market Street
Philadelphia Pennsylvania
U.S.A. 19103-1699
Telephone: 215-977-6182 (Joanne Houck)

EMERGENCY TELEPHONE NO. : 800-964-8861 (SUN COMPANY, AFTER NORMAL
BUSINESS HOURS)
800-424-9300 (CHEMTREC, AFTER NORMAL
BUSINESS HOURS)

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1. CHEMICAL PRODUCT AND COMPANY INFORMATION

REVISION DATE: 06/29/1999
UN NUMBER- UN1993

PRIMARY APPLICATION- WINDSHIELD WASHER FLUID

MANUFACTURER- SUN COMPANY, INC.
TEN PENN CENTER
1801 MARKET STREET
PHILADELPHIA PA 19103-1699

SYNONYMS..... : WINDSHIELD WASHER PREMIX

CAS REGISTRY NO: SEE SEC. 2

CAS NAME..... : NO CLASSIFICATION - MIXTURE

CHEMICAL FAMILY: BLEND

INFORMATION

SUPPLIER.. JOANNE HOUCK

PHONE.... : (610) 859-1120

EMERGENCY PHONE NUMBERS (AFTER NORMAL BUSINESS HOURS)

SUN CO.. 1-800-964-8861

=====

WINSHIELD WASHER FLUID

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CHEMTREC. 1-800-424-9300

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2. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT/CAS NO.	LO%	HI%	OSHA		EXPOSURE GUIDELINES				UNIT
			TWA	STEL	ACGIH	SUN/MFR			
					TWA	STEL	TWA	STEL	
LIMITS FOR THE PRODUCT:									
					NO SPECIFIC LIMIT				
METHANOL									
67-56-1	35.00	45.00	200	250	200	250			PPM
WATER									
7732-18-5	55.00	65.00			NO SPECIFIC LIMIT				
C.I. ACID BLUE 9									
3844-45-9	.00	1.00			NO SPECIFIC LIMIT				
ADDITIONAL EXPOSURE LIMITS ----- GOVERNMENT REGULATION									
OTHER LIMIT- SEE SECTION 2									

=====

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW -----

DANGER] FLAMMABLE LIQUID AND VAPOR. HARMFUL IF INHALED. HIGH VAPOR CONCENTRATIONS MAY CAUSE DIZZINESS. MAY CAUSE SKIN IRRITATION. CAUSES EYE IRRITATION. POISON] MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED. MAY CAUSE SEVERE CHRONIC TOXICITY.

APPEARANCE-- CLEAR BLUE LIQUID ODOR-- MILD ALCOHOL ODOR

POTENTIAL HEALTH EFFECTS -----

PRIMARY ROUTES OF ENTRY- INHALATION(X) SKIN(X) EYE(X) INGESTION(X)

INHALATION -----

EXCESSIVE EXPOSURES MAY CAUSE IRRITATION TO EYES, NOSE, THROAT, LUNGS; RESPIRATORY TRACT; CENTRAL NERVOUS SYSTEM (BRAIN) EFFECTS; HEADACHES, NAUSEA; DIZZINESS, LOSS OF BALANCE AND COORDINATION; UNCONSCIOUSNESS, COMA; RESPIRATORY FAILURE AND DEATH. REPEATED EXCESSIVE EXPOSURES MAY CAUSE LIVER EFFECTS OR DAMAGE. KIDNEY EFFECTS OR DAMAGE.

SKIN -----

SKIN ABSORPTION OF MATERIAL MAY PRODUCE SYSTEMIC TOXICITY. MAY CAUSE MODERATE IRRITATION WITH PROLONGED OR REPEATED CONTACT. REMOVES NATURAL OILS & FATS FROM SKIN.

EYE -----

CONTACT WITH THE EYE MAY CAUSE MODERATE IRRITATION. CORNEAL DAMAGE OR OPACITY.

INGESTION -----

HARMFUL OR FATAL IF SWALLOWED. CANNOT BE MADE NON-POISONOUS. INGESTION OF THIS MATERIAL MAY CAUSE BLINDNESS; CENTRAL NERVOUS SYSTEM (BRAIN)

=====

WINSHIELD WASHER FLUID

=====

EFFECTS; NAUSEA, VOMITING AND DIARRHEA; INGESTION OF THIS MATERIAL MAY CAUSE DAMAGE TO CENTRAL NERVOUS SYSTEM (BRAIN); VISION; LIVER; KIDNEYS;

CARCINOGEN LISTED BY-IARC(NO) NTP(NO) OSHA(NO) ACGIH(NO) OTHER(NO)

PRE-EXISTING MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE-
DISORDERS OR DISEASES OF THE SKIN, EYE, LIVER, KIDNEY, RESPIRATORY,
PULMONARY AND LUNG (E.G. ASTHMA-LIKE CONDITIONS).

=====

4. FIRST AID MEASURES

INHALATION -----

MOVE PERSON TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, OBTAIN MEDICAL ASSISTANCE.

SKIN -----

WASH WITH SOAP AND WATER UNTIL NO ODOR REMAINS. IF REDNESS OR SWELLING DEVELOPS, OBTAIN MEDICAL ASSISTANCE. IMMEDIATELY REMOVE SOAKED CLOTHING. WASH CLOTHING BEFORE REUSE. DESTROY CONTAMINATED SHOES.

EYE -----

FLUSH WITH WATER FOR AT LEAST 15 MINUTES. OBTAIN MEDICAL ASSISTANCE.

INGESTION -----

GIVE LIQUIDS AND INDUCE VOMITING UNLESS VICTIM IS UNCONSCIOUS. IF INDIVIDUAL IS CONSCIOUS, GIVE MILK OR WATER TO DILUTE. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IF VICTIM IS CONSCIOUS AND ALERT VOMITING SHOULD BE INDUCED BY OR UNDER THE DIRECTION OF A PHYSICIAN OR POISON CONTROL CENTER. OBTAIN EMERGENCY MEDICAL ATTENTION.

=====

5. FIRE FIGHTING MEASURES

FLASH POINT: 98 (DEG. F); 36 (DEG. C)

AUTOIGNITION TEMP.: NOT DETERMINED (DEG. F); NOT DETERMINED (DEG. C)

---FLAMMABLE LIMITS IN AIR---

LOWER EXPLOSIVE LIMIT (LEL): NOT DETERMINED % VOLUME

UPPER EXPLOSIVE LIMIT (UEL): NOT DETERMINED % VOLUME

FIRE AND EXPLOSION HAZARDS -----

FLAMMABLE LIQUID (FLASH POINT LESS THAN 100F)

EXTINGUISHING-MEDIA -----

WATER SPRAY. ALCOHOL RESISTANT FOAM. DRY CHEMICAL. CARBON DIOXIDE.

SPECIAL FIRE FIGHTING INSTRUCTIONS -----

USE WATER SPRAY. COOL TANK/ CONTAINER. WEAR SELF-CONTAINED BREATHING APPARATUS. WEAR STRUCTURAL FIREFIGHTERS PROTECTIVE CLOTHING.

NFPA/HMIS CLASSIFICATION

HAZARD RATING

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WINSHIELD WASHER FLUID

=====

SPECIFIC HAZARD: FLAMMABLE

=====

PREVENT IGNITION; STOP LEAK; VENTILATE AREA. CONTAIN SPILL. USE WATER SPRAY TO DISPERSE VAPORS. KEEP UPWIND OF LEAK. USE PERSONAL PROTECTIVE EQUIPMENT STATED IN SECTION 8. ADVISE EPA; STATE AGENCY IF REQUIRED. ABSORB ON INERT MATERIAL. SHOVEL, SWEEP OR VACUUM SPILL.

=====

KEEP AWAY FROM HEAT, SPARKS AND FLAME. KEEP IN COOL, DRY PLACE. KEEP CONTAINER TIGHTLY CLOSED. KEEP IN WELL VENTILATED SPACE. STORAGE HAS TEMPERATURE LIMITS--SEE STABILITY. NFPA CLASS 1C STORAGE. CONSULT NFPA AND OSHA CODES. TRANSFER OPERATIONS MUST BE ELECTRICALLY GROUNDED TO DISSIPATE STATIC BUILDUP. AVOID PROLONGED BREATHING OF MIST OR VAPOR. AVOID CONTACT WITH THIS MATERIAL. AVOID CONTACT WITH EYES. WASH THOROUGHLY AFTER HANDLING. NEVER SIPHON BY MOUTH.

CONSULT WITH A HEALTH/SAFETY PROFESSIONAL FOR SPECIFIC SELECTION.

VENTILATION -----

USE ONLY WITH ADEQUATE VENTILATION. VENTILATE AS NEEDED TO COMPLY WITH EXPOSURE LIMIT. EXPLOSION PROOF VENTILATION EQUIPMENT REQUIRED.

PERSONAL PROTECTIVE EQUIPMENT -----

EYE -----

SPLASH PROOF CHEMICAL GOGGLES OR FULL FACE SHIELD RECOMMENDED TO PROTECT AGAINST SPLASH OF PRODUCT.

GLOVES -----

PROTECTIVE GLOVES RECOMMENDED WHEN PROLONGED SKIN CONTACT CANNOT BE AVOIDED. THE FOLLOWING GLOVE MATERIALS ARE ACCEPTABLE: POLYETHYLENE; NEOPRENE; NITRILE; POLYVINYL ALCOHOL; VITON; NATURAL RUBBER;

RESPIRATOR -----

CONCENTRATION-IN-AIR DETERMINES PROTECTION NEEDED. USE ONLY NIOSH
CERTIFIED RESPIRATORY PROTECTION. HALF-MASK AIR PURIFYING RESPIRATOR

=====

WINSHIELD WASHER FLUID

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WITH ORGANIC VAPOR CARTRIDGES IS ACCEPTABLE TO 10 TIMES THE EXPOSURE LIMIT. FULL-FACE AIR PURIFYING RESPIRATOR WITH ORGANIC VAPOR CARTRIDGES IS ACCEPTABLE TO 50 TIMES THE EXPOSURE LIMIT NOT TO EXCEED THE CARTRIDGE LIMIT OF 1000 PPM. PROTECTION BY AIR PURIFYING RESPIRATORS IS LIMITED. USE A POSITIVE PRESSURE-DEMAND FULL-FACE SUPPLIED AIR RESPIRATOR OR SCBA FOR EXPOSURES ABOVE 50X THE EXPOSURE LIMIT. IF EXPOSURE IS ABOVE IDLH(IMMEDIATELY DANGEROUS TO LIFE & HEALTH) OR THERE IS THE POSSIBILITY OF AN UNCONTROLLED RELEASE OR EXPOSURE LEVELS ARE UNKNOWN THEN USE A POSITIVE PRESSURE-DEMAND FULL-FACE SUPPLIED AIR RESPIRATOR WITH ESCAPE BOTTLE OR SCBA.

OTHER -----

IF CONTACT IS UNAVOIDABLE, WEAR CHEMICAL RESISTANT CLOTHING. THE FOLLOWING MATERIALS ARE ACCEPTABLE AS PROTECTIVE CLOTHING MATERIALS: POLYETHYLENE; POLYVINYL ALCOHOL(PVA); NEOPRENE; NITRILE; VITON; SAFETY SHOWER AND EYE WASH AVAILABILITY RECOMMENDED. LAUNDER SOILED CLOTHES. FOR NON-FIRE EMERGENCIES, POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS (SCBA) & STRUCTURAL FIREFIGHTERS' PROTECTIVE CLOTHING WILL PROVIDE LIMITED PROTECTION.

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9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT..... : 148 (DEG. F) _____ 64 (DEG. C)
MELTING POINT..... : N.D. (DEG. F) _____ N.D. (DEG. C)
SPECIFIC GRAVITY... : 0.97 (WATER=1)
PACKING DENSITY.... : N/A (KG/M3)
VAPOR PRESSURE..... : 97.68 (MM HG @ 20 DEG C)
VAPOR DENSITY..... : N/A (AIR=1)
SOLUBILITY IN WATER.: 100% (% BY VOLUME)
PH INFORMATION..... : N.D. AT CONC. N.D. G/L H2O
% VOLATILES BY VOL.. : N/A
EVAPORATION RATE... : N/A (ETHYL ETHER=1)
OCTANOL/WATER COEFF.: N.D.
APPEARANCE..... : CLEAR BLUE LIQUID
ODOR..... : MILD ALCOHOL ODOR
ODOR THRESHOLD..... : N.D. (PPM)
VISCOSITY..... : N.D. SUS @ N.D DEG F ... N.D. CST @ N.D DEG C
MOLECULAR WEIGHT... : N.D. (G/MOLE)

=====

10. STABILITY AND REACTIVITY

STABILITY -----

STABLE

CONDITIONS TO AVOID-

HEAT, SPARKS AND OPEN FLAMES. STORE AT TEMPERATURES BELOW 120 DEG F.

INCOMPATIBLE MATERIALS -----

STRONG OXIDIZERS

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WINSHIELD WASHER FLUID

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HAZARDOUS DECOMPOSITION -----

COMBUSTION WILL PRODUCE CARBON MONOXIDE AND ASPHYXIANTS

POLYMERIZATION -----

WILL NOT OCCUR.

=====

11. TOXICOLOGICAL INFORMATION

FOR THE PRODUCT -----

INHALATION/ORAL: POISON] CANNOT BE MADE NON-POISONOUS. HARMFUL/FATAL IF INHALED OR SWALLOWED. EFFECTS MAY BE DELAYED. OVEREXPOSURE MAY CAUSE EYE & RESPIRATORY IRRITATION, HEADACHE, NAUSEA, VOMITING, VISUAL IMPAIRMENT, CONFUSION, RESPIRATORY FAILURE, COMA & DEATH. IF SWALLOWED CAN CAUSE BLINDNESS, SEVERE GASTROINTESTINAL TRACT IRRITATION, CNS (BRAIN) EFFECTS. MASSIVE OVERDOSE MAY CAUSE HEART, LIVER, KIDNEY, BRAIN EFFECTS/DAMAGE. SKIN: CAN BE ABSORBED. PROLONGED OR REPEATED CONTACT MAY CAUSE MODERATE IRRITATION, NUMBNESS, REDNESS, DERMATITIS. EYE: IRRITANT. CAN CAUSE PAIN, SWELLING, DOUBLE VISION, CORNEAL INJURY AND PERMANENT BLINDNESS.

METHANOL (COMPONENT)

INHALATION/ORAL: POISON] CANNOT BE MADE NON-POISONOUS. HARMFUL/FATAL IF INHALED OR SWALLOWED. EFFECTS MAY BE DELAYED. OVEREXPOSURE MAY CAUSE EYE & RESPIRATORY IRRITATION, HEADACHE, NAUSEA, VOMITING, VISUAL IMPAIRMENT, CONFUSION, RESPIRATORY FAILURE, COMA & DEATH. LC50 (RAT) 4HR:64000 PPM. IF SWALLOWED, MAY CAUSE BLINDNESS, SEVERE GI IRRITATION CNS (BRAIN) EFFECTS. MASSIVE OVERDOSE MAY CAUSE HEART, LIVER, KIDNEY, BRAIN EFFECTS/DAMAGE. SKIN: CAN BE ABSORBED. PROLONGED OR REPEATED CONTACT MAY CAUSE MODERATE IRRITATION, NUMBNESS, REDNESS, DERMATITIS. EYE: IRRITANT. CAN CAUSE PAIN, SWELLING, DOUBLE VISION, CORNEAL INJURY AND PERMANENT BLINDNESS.

WATER (COMPONENT)

INHALATION: NON-TOXIC UNDER USUAL CIRCUMSTANCES. ENTRY OF WATER INTO THE LUNGS EXCLUDES OXYGEN AND ACTS AS AN ASPHYXANT, AND CAN CAUSE DEATH (DROWNING). SKIN: MINIMAL IRRITATION WITH PROLONGED OR REPEATED CONTACT. WHEN HEATED, MAY CAUSE THERMAL BURNS TO SKIN AND EYE. ORAL: NON-TOXIC.

C.I. ACID BLUE 9 (COMPONENT)

NO DATA AVAILABLE FOR ANY ROUTE OF EXPOSURE.

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12. ECOLOGICAL INFORMATION

ENVIRONMENTAL DATA-----

NO DATA AVAILABLE.

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WINSHIELD WASHER FLUID

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13. DISPOSAL CONSIDERATIONS

FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS. RCRA HAZARDOUS WASTE. DO NOT FLUSH TO DRAIN/ STORM SEWER. CONTRACT TO AUTHORIZED DISPOSAL SERVICE.

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14. TRANSPORTATION INFORMATION

DOT-
PROPER SHIPPING NAME- FLAMMABLE LIQUID, N.O.S. (CONTAINS METHANOL)
HAZARD CLASS- 3 (FLAMMABLE LIQUID)
IDENTIFICATION NUMBER- UN1993
LABEL REQUIRED- PG II, FLAMMABLE LIQUID

IMDG- PROPER SHIPPING NAME- NO DATA AVAILABLE

IATA- PROPER SHIPPING NAME- NO DATA AVAILABLE

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15. REGULATORY INFORMATION

SARA 302 THRESHOLD PLANNING QUANTITY. N/A

SARA 304 REPORTABLE QUANTITY 11111 POUNDS

SARA 311 CATEGORIES- IMMEDIATE (ACUTE) HEALTH EFFECTS.. Y
 DELAYED (CHRONIC) HEALTH EFFECTS.. Y
 FIRE HAZARD Y
 SUDDEN RELEASE OF PRESSURE HAZARD. N
 REACTIVITY HAZARD N

WHEN A PRODUCT AND/OR COMPONENT IS LISTED BELOW, THE REGULATORY LIST ON WHICH IT APPEARS IS INDICATED.

METHANOL - CT MA NJ PA RI WV 01 07		
01=SARA 313	02=SARA 302/304	03=IARC CARCINOGEN
04=OSHA CARCINOGEN	05=ACGIH CARCINOGEN	06=NTP CARCINOGEN
07=CERCLA 302.4	08=WHMIS CONTROLLED PROD.	
10=OTHER CARCINOGEN		
PA=PENNSYLVANIA RTK	NJ=NEW JERSEY RTK	CA=CALIFORNIA PROP 65
MA=MASSACHUSETTS RTK	MI=MICHIGAN 406	MN=MINNESOTA RTK
FL=FLORIDA	RI=RHODE ISLAND	IL=ILLINOIS
NY=NEW YORK	WV=WEST VIRGINIA	CT=CONNECTICUT
LA=LOUISIANA	ME=MAINE	OH=OHIO

THIS PRODUCT OR ALL COMPONENTS OF THIS PRODUCT ARE LISTED ON THE U.S. TSCA INVENTORY.

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16. OTHER INFORMATION

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WINSHIELD WASHER FLUID

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NONE

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XANTHATE POTASSIUM AMYL

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* * * * *

* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2494557

PRODUCT NAME(S) : Xanthate Potassium Amyl

PRODUCT IDENTIFICATION : Code LA1352

DATE OF MSDS : 1999-03-25

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-12-20

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : VAN WATERS & ROGERS LTD

ADDRESS : 9800 Van Horne Way
Richmond British Columbia
Canada V6X 1W5

EMERGENCY TELEPHONE NO. : 800-424-9300 (CHEMTREC)

*** MATERIAL SAFETY DATA ***

Xanthate Potassium Amyl LA1352 1 99-03-25EEE
LA1352.1 Xanthate Potassium Amyl

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VAN WATERS & ROGERS LTD. 9800 VAN HORNE WAY RICHMOND, B C. V6X 1W5

WHMIS CODES: B.6 D.1B

For Emergency Assistance
Involving Chemicals Call
CHEMTREC (800) 424-9300

WHMIS (Classification)
WHMIS CLASS B-6: Reactive and very
flammable material.
WHMIS CLASS D-1B: Material causing
immediate and serious toxic
effects (TOXIC).

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XANTHATE POTASSIUM AMYL

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****Section I. Chemical Product Identification****

Product Name	Xanthate Potassium Amyl	Code	LA1352
		CAS#	Not applicable.
Synonym	Not available.	DSL	On the DSL list.
Chemical Name	Not applicable.	CI#	Not available.
Chemical Family	Not available.		
Chemical Formula	Not applicable.		
Material Uses	Not available.		

****Section II. Composition and Information on Ingredients****

Name	CAS #	% by Weight	Exposure Limits	
			TLV/PEL	LC50/LD50
Potassium amyl xanthate	002720732	60-100	Not available.	ORAL (LD50): Acute: 1000 mg/kg [Rat].
Potassium Hydroxide	001310583	1-5	CEIL: 2 (mg/m3)) from ACGIH (TLV) TWA: 2 (mg/m3)	ORAL (LD50): Acute: 273 mg/kg [Rat].
Isoamyl alcohol	000123513	1-5	TWA: 100 CEIL: 125 (ppm) from ACGIH (TLV) TWA: 360 CEIL: 450 (mg/m3)	ORAL (LD50): Acute: 3438 mg/kg [Rabbit]. 1300 mg/kg [Rat].

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XANTHATE POTASSIUM AMYL

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****Section III. Hazards Identification****

Potential Acute Health Effects	Extremely hazardous in case of skin contact (corrosive). Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.
Potential Chronic Health Effects	Extremely hazardous in case of skin contact (corrosive). CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

****Section IV. First Aid Measures****

Eye Contact	Check for and remove any contact lenses. IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. COLD water may be used. DO NOT use an eye ointment. Seek medical attention.
Skin Contact	After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. COLD water may be used. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.
Hazardous Skin Contact	Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.
Inhalation	Allow the victim to rest in a well-ventilated area. Seek immediate medical attention.
Hazardous Inhalation	Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.
Ingestion	DO NOT induce vomiting. Examine the lips and mouth to

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XANTHATE POTASSIUM AMYL

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ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Hazardous No additional information.
Ingestion

****Section V. Fire and Explosion Data****

The Product is: Flammable.

Auto-Ignition Not available.
Temperature

Flash Points Not available.

Flammable LOWER: 1.25% UPPER: 50%
Limits

Products of These products are carbon oxides (CO, CO₂), sulfur oxides
Combustion (SO₂, SO₃..). Some metallic oxides.

Fire Hazards in Flammable in presence of heat, of oxidizing materials.
Presence of
Various
Substances

Explosion Risks of explosion of the product in presence of
Hazards in mechanical impact: Not available.
Presence of Risks of explosion of the product in presence of static
Various discharge: Not available.
Substances Slightly explosive to explosive in presence of oxidizing
 materials.

Fire Fighting Flammable solid.
Media SMALL FIRE: Use DRY chemicals, CO₂, water spray or foam.
and LARGE FIRE: Use water spray or fog. Cool containing
Instructions vessels with water jet in order to prevent pressure
 build-up, autoignition or explosion.

Special Remarks No additional remark.
on
Fire Hazards

Special Remarks Vapors or dust may explode.
on Explosion
Hazards

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XANTHATE POTASSIUM AMYL

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****Section VI. Accidental Release Measures****

Small Spill	Use appropriate tools to put the spilled solid in a convenient waste disposal container. If necessary: Neutralize the residue with a dilute solution of acetic acid.
Large Spill	Spontaneously combustible solid. Stop leak if without risk. Absorb with an inert material and put the spilled material in an appropriate waste disposal. Obtain advice on use of water as spilled material may react with it. DO NOT touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all sources of ignition. Cover with WET earth, sand or other non-combustible material. Call for assistance on disposal. Neutralize the residue with a dilute solution of acetic acid. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

****Section VII. Handling and Storage****

Precautions	Keep locked up. DO NOT ingest. DO NOT breathe dust. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, metals, acids.
Storage	Keep container tightly closed. Keep in a cool and well-ventilated area. Highly toxic or infectious materials should be stored in a separate locked safety storage cabinet or room.

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

Engineering Controls	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal Protection	Splash goggles. Lab coat. Dust respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Gloves.
Personal Protection in Case of a Large	Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested

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XANTHATE POTASSIUM AMYL

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Spill	protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits	Potassium Hydroxide
ACGIH (TLV)	CEIL: 2 (mg/m3) from
	TWA: 2 (mg/m3)
	Isoamyl alcohol
	TWA: 100 CEIL: 125 (ppm)
	TWA: 360 CEIL: 450 (mg/m3)
	Consult local authorities for acceptable exposure limits.

****Section IX. Physical and Chemical Properties****

Physical State and Appearance	Solid.	Odor Sulfurous.
		Taste Not available.
Molecular Weight	Not applicable.	Color Yellow. Yellow to Green.
pH (1% soln/water)	10.5 [Basic.]	
Boiling Point	Not available.	
Melting Point	380 C (716 F) based on data for: Potassium Hydroxide.	
Critical Temperature	Not available.	
Specific Gravity	Weighted average: 1.16 (Water = 1)	
Vapor Pressure	The highest known value is 0 mm of Hg (@ 20 C) (Potassium Hydroxide).	
Vapor Density	Not available.	
Volatility	<20% (v/v).	
Odor Threshold	Not available.	
Evaporation rate	Not available.	
Viscosity	Not available.	
Water/Oil Dist. Coeff.	Not available.	

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XANTHATE POTASSIUM AMYL

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Ionicity (in Water)	Not available.
Dispersion Properties	See solubility in water.
Solubility	Soluble in cold water. Insoluble in diethyl ether.

****Section X. Stability and Reactivity Data****

Stability	The product is stable.
Instability Temperature	Not available.
Conditions of Instability	Solid xanthates are stable when kept cool and dry, exposure to heat causes decomposition. Acids and oxidizing agents accelerate aging. In solution, xanthates will decompose slowly even at room temperature.
Incompatibility with various substances	Highly reactive with metals. Reactive with oxidizing agents, acids.
Corrosivity	Highly corrosive in presence of aluminum, of zinc, of copper.
Special Remarks on Reactivity	Hazardous Decomposition Products: Carbon disulphide, trithiocarbonate, amyl alcohol.
Special Remarks on Corrosivity	No additional remark.
Hazardous Polymerization	No.

****Section XI. Toxicological Information****

Routes of Entry	Eye contact. Inhalation. Ingestion.
Toxicity to Animals	Acute oral toxicity (LD50): 273 mg/kg [Rat]. (Potassium Hydroxide). Acute dermal toxicity (LD50): 3220 mg/kg [Rabbit]. (Isoamyl alcohol).
Chronic Effects on Humans	Extremely hazardous in case of skin contact (corrosive). CARCINOGENIC EFFECTS: Not available.

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XANTHATE POTASSIUM AMYL

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MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Other Toxic Effects on Humans Extremely hazardous in case of skin contact (corrosive). Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Special Remarks: No additional remarks on Toxicity to Animals

Special Remarks: No additional remarks on Chronic Effects on Humans

Special Remarks: No additional remarks on other Toxic Effects on Humans

****Section XII. Ecological Information****

Ecotoxicity Not available.

BOD5 and COD Not available.

Products of Biodegradation Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation No additional remark.

****Section XIII. Disposal Considerations****

Waste Disposal Recycle, if possible. Consult your local or regional authorities.

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XANTHATE POTASSIUM AMYL

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****Section XIV. Transport Information****

TDG Classification	TDG CLASS 4.2: Spontaneously combustible substance.
Shipping name	Xanthates
PIN	UN3342
Packing Group	III
Special Provisions for Transport	No additional remark.

****Section XV. Other Regulatory Information****

Other Regulations	OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
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****Section XVI. Other Information****

References Not available.

Other Special Considerations No additional remark.

Verified by Hardev Bendick.

Validated by Hardev Bendick on
2/19/99.

Information Contact EH&S Department
Vancouver, B C.
(604) 273-1441

FOR UPDATED COPIES OF AN MSDS, PLEASE CONTACT YOUR LOCAL VAN WATERS
& ROGERS LTD. BRANCH.

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XANTHATE POTASSIUM AMYL

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Notice to Reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Van Waters & Rogers Ltd. expressly disclaims all expressed or implied warranties of merchantability and fitness for a particular purpose with respect to the product provided.

===== END OF MSDS =====

ZINC CONCENTRATE



MATERIAL SAFETY DATA SHEET

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identity: Polaris Zinc Concentrate

Manufacturer:

Cominco Mining Partnership
Polaris Operations
Polaris, N.W.T.
X0A 0Y0

Emergency Telephone: (250) 364-4214

Supplier:

Teck Cominco Metals Ltd.
1500 - 120 Adelaide Street, W.
Toronto, Ontario
M5H 1T1

MSDS Preparer:

Teck Cominco Metals Ltd.
600 - 200 Burrard Street
Vancouver, British Columbia
V6C 3L7

Date of MSDS Preparation: July 23, 1997

Product Use: Zinc concentrate is used in the production of zinc metal and zinc alloys.

SPECIAL NOTES:

Caution: The toxicological properties of this material have not been fully investigated. The information contained in this MSDS is based on information in the technical and scientific literature about the material's constituent compounds. Use appropriate procedures to prevent direct contact with the skin or eyes and to prevent ingestion or inhalation.

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredient	Approximate Percent by Weight	C.A.S. Number	Exposure Limits*		LD ₅₀ /LC ₅₀ Species and Route
Zinc Sulfide	89 to 97	1314-98-3	OSHA PEL**	None established	Human-inh TCLo 124 mg/m ³ /50M
			ACGIH TLV**	None established	Rat-oral LD ₅₀ >2 gm/kg
			NIOSH REL**	None established	Rat-inh LC ₅₀ >5040 mg/m ³ /4H
					Rat-skin LD ₅₀ >2 gm/kg
Iron Sulfide	2 to 4	7439-89-6	OSHA PEL***	None established	No data
			ACGIH TLV***	None established	
			NIOSH REL***	None established	
Lead Sulfide	1 to 2	1314-87-0	OSHA PEL	0.05 mg/m ³	Guinea Pig-oral LDLo 10 gm/kg
			ACGIH TLV	0.05 mg/m ³	
			NIOSH REL	<0.1 mg/m ³	

NOTE: TLVs for individual states may differ from OSHA TLVs. Check with local authorities for the applicable state TLVs.

*OSHA - Occupational Safety and Health Administration; ACGIH - American Conference of Governmental Industrial Hygienists; NIOSH - National Institute for Occupational Safety and Health.

**The OSHA PEL for zinc oxide dust is 15 mg/m³ total and 5 mg/m³ respirable. The ACGIH TLV for zinc oxide dust is 10 mg/m³ and the NIOSH REL for zinc oxide dust is 5 mg/m³ with a STEL of 15 mg/m³.

***The OSHA PEL for iron oxide fume is 10 mg/m³. The ACGIH TLV and the NIOSH REL for iron oxide dust and fume is 5 mg/m³.

European Economic Community (EEC) Classification: Lead: Lead compounds are classified as Category 1 and Category 3 reproductive toxins and as harmful.

July 23, 1997

Polaris Zinc Concentrate

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ZINC CONCENTRATE

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EEC R Phrase(s): Lead Compounds: R61 - may cause harm to unborn child; R62 - possible risk of impaired fertility; R20/22 - harmful by inhalation and if swallowed; R33 - danger of cumulative effects.

Trade Names and Synonyms: None

SECTION 3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance: Dark brown talc-like substance. Caution! The toxicological properties of this substance have not been fully investigated. Overexposure may cause eye, skin, digestive tract, and respiratory tract irritation. Many lead compounds can produce toxic effects in blood forming organs, kidneys and the central nervous system. May cause adverse reproductive or fetal effects. Lead compounds may cause cancer based on studies on laboratory animals. Use appropriate procedures to prevent direct contact with the skin or eyes and to prevent ingestion or inhalation.

EYE:

Eye contact may cause eye irritation.

SKIN:

Skin contact may cause skin irritation.

INHALATION:

Dust is irritating to the nose, throat, and respiratory tract. May cause effects similar to those described for ingestion. The toxicological properties of this substance have not been fully investigated.

INGESTION:

Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Many lead compounds can produce toxic effects in blood forming organs, kidneys and the central nervous system. The toxicological properties of this substance have not been fully investigated.

SIGNS AND SYMPTOM OF EXPOSURE:

Lead is a cumulative poison. When significant continuous or periodic exposure occurs, increasing amounts build up in the body and eventually symptoms and disability may occur. Some signs and symptoms of exposure to lead compounds include gastrointestinal discomfort, a blue-black line on the gums, neuromuscular dysfunction including muscle weakness and paralysis, and mental changes.

CHRONIC EFFECTS:

Many lead compounds can produce toxic effects in blood forming organs, kidneys and the central nervous system. May cause adverse reproductive or fetal effects. Lead compounds may cause cancer based on studies with laboratory animals. The toxicological properties of this substance have not been fully investigated.

REPRODUCTIVE HAZARDS:

Overexposure to lead compounds may cause adverse reproductive effects. Unborn and nursing children can be exposed to lead through their mother. This may cause premature births, smaller babies, and decreased mental ability in the infant.

CARCINOGENICITY INFORMATION:

Lead compounds may cause cancer based on studies with laboratory animals.

TARGET ORGAN:

Target Organs for lead compounds include: the central and peripheral nervous systems, blood-forming organs, kidneys, and the male reproductive system.

SECTION 4. FIRST AID MEASURES

EYE CONTACT FIRST AID:

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Polaris Zinc Concentrate

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ZINC CONCENTRATE

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Immediately flush eyes with plenty of water for at least 15 minutes occasionally lifting the upper and lower eyelids. Get medical attention if irritation develops or persists.

SKIN CONTACT FIRST AID:

Flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing - wash before reuse. Get medical aid if irritation develops or persists.

INHALATION FIRST AID:

If exposed to excessive levels of dusts or fumes, remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if cough or other symptoms develop.

INGESTION FIRST AID:

If victim is conscious and alert, give 2 - 4 cupfuls of water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

NOTES TO PHYSICIAN:

Treat symptomatically and supportively. Chelators of choice for lead poisoning are BAL, calcium-disodium EDTA and penicillamine.

SECTION 5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

TCC Flash Point: None

Autoignition Temperature: N/A

FLAMMABLE LIMITS IN AIR

LEL: N/A

UEL: N/A

EXTINGUISHING MEDIA:

In case of fire, use water spray, dry chemical, carbon dioxide, or alcohol-resistant foam.

FIRE AND EXPLOSION HAZARDS:

During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

FIRE FIGHTING INSTRUCTIONS:

As in any fire, wear self-contained breathing apparatus pressure-demand MSHA/NIOSH (approved or equivalent) and full protective gear. Avoid breathing smoke, fumes, and decomposition products.

COMBUSTION PRODUCTS:

Excess heat will generate sulfur oxide, zinc oxide, and lead oxide fumes. Contact with acids will generate flammable and toxic hydrogen sulfide gas.

SECTION 6. ACCIDENTAL RELEASE MEASURES

SAFEGUARDS (PERSONNEL):

Use proper personal protective equipment as specified in Section 8.

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ZINC CONCENTRATE

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INITIAL CONTAINMENT:

Contain spilled material.

LARGE SPILLS PROCEDURE:

Contain spilled material. Clean up spilled material immediately, observing precautions in the Protective Equipment Section. Place in suitable container for recovery or disposal. Treat or dispose of waste material in accordance with all local, state/provincial, and national requirements.

SMALL SPILLS PROCEDURE:

Clean up spilled material immediately, observing precautions in the Protective Equipment Section. Place in suitable container for recovery or disposal. Treat or dispose of waste material in accordance with all local, state/provincial, and national requirements.

SECTION 7. HANDLING AND STORAGE

HANDLING (PERSONNEL):

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Avoid contact with eyes, skin and clothing. Avoid ingestion and inhalation.

HANDLING (PHYSICAL ASPECTS):

Avoid excessive heat. Avoid contact with acids or oxidizers.

STORAGE PRECAUTIONS:

Store in a cool dry area. Avoid extreme temperatures. Keep away from acids and oxidizers.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

EYE/FACE PROTECTION REQUIREMENTS:

Wear safety glasses with side shields (or goggles) and a face shield, if splashing of the material may occur. Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133.

SKIN PROTECTION REQUIREMENTS:

Wear appropriate protective gloves and clothing to prevent skin exposure.

RESPIRATORY PROTECTION REQUIREMENTS:

Follow the OSHA respirator regulations found in 29 CFR 1910.134. Always use a NIOSH approved respirator when required. Use of a NIOSH approved dust respirator is recommended when using or handling this product.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

FORMSolid, fine-grained powder
PARTICLE SIZE.....<40 um, 80% <20 um
COLOR.....Dark grey-brown
ODOR.....Weak organic odor from entrained xanthates

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ZINC CONCENTRATE

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ODOR THRESHOLD.....None
BOILING POINT.....Not applicable (1050-2300°C in an inert atmosphere)
SOLUBILITY IN WATER.....Slight or very slight
SPECIFIC GRAVITY.....2.0 (Water = 1) in bulk
MELTING/FREEZING POINT.....Not applicable (will burn first unless in an inert atmosphere)
pH.....7.5 to 8.5
% VOLATILES.....8.4% @ 100°C
IGNITION TEMPERATURE.....Between 700-800°C (generates SO₂ and zinc, lead vapors)

SECTION 10. STABILITY AND REACTIVITY

STABILITY:

Stable under normal temperatures and pressures.

INCOMPATIBILITY WITH OTHER MATERIALS:

Reacts violently with iodine pentachloride. Incompatible with iodine monochloride, hydrogen peroxide, strong oxidizers, and strong acids. May release toxic and flammable hydrogen sulfide gas on contact with acids.

DECOMPOSITION:

This material can decompose by high temperatures forming sulfur oxides, zinc oxide, lead and lead oxide, and toxic and flammable hydrogen sulfide gas.

CONDITIONS TO AVOID:

Contact with incompatible materials (see above), excessive heat and contact with acids and oxidizers.

SECTION 11. TOXICOLOGICAL INFORMATION

EYE EFFECT:

Contact with eyes causes irritation.

SKIN EFFECTS:

Contact with skin may cause skin irritation.

ACUTE ORAL EFFECTS:

Causes gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

ACUTE INHALATION EFFECTS:

Dust is irritating to the nose, throat, and respiratory tract. May cause effects similar to those described for ingestion. The toxicological properties of this substance have not been fully investigated.

REPRODUCTIVE AND BIRTH EFFECTS:

Unborn and nursing children can be exposed to lead through their mother. This may cause premature births, smaller babies, and decreased mental ability in the infant. High levels of exposure may cause abortion and damage the male reproductive system.

CHRONIC EFFECTS:

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ZINC CONCENTRATE

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In adults, lead exposure may decrease reaction time, possibly affect the memory, cause weakness in fingers, wrists, and ankles, increase blood pressure in middle-aged men, and cause anemia - a blood disorder.

Unborn and nursing children can be exposed to lead through their mother. This may cause premature births, smaller babies, and decreased mental ability in the infant.

GENETIC TOXICITY:

Lead compounds may have an effect on chromosomes.

SECTION 12. ECOLOGICAL INFORMATION

Lead concentrate is insoluble in water. Certain elements are known to bioaccumulate or bioconcentrate in select environmental media.

Lead: Lead compounds are highly persistent in water. Dissolved lead compounds bioaccumulate in plants and animals, both aquatic and terrestrial. In most surface water and groundwater, lead forms compounds with anions such as hydroxides, carbonates, sulfates, and phosphates and precipitates out of the water column. Lead may occur as sorbed ions or surface coatings on sediment mineral particles or may be carried in colloidal particles in surface water. Most lead is strongly retained in soil, resulting in little mobility. Lead may be immobilized by ion exchange with hydrous oxides or clays or by chelation with humic or fulvic acids in the soil.

Zinc: Zinc in the aquatic environment is adsorbed onto iron and manganese oxides, clay minerals, and organic material in sediments or suspended solids in surface waters. The mobility of zinc in soil is dependent on soil conditions, such as cation exchange capacity, pH, redox potential, and chemical species present in the soil. In general, zinc sorbs strongly to soil particulates and, unless it occurs in a soluble form such as zinc sulfate, is not highly mobile in soil. In aquatic systems, zinc bioaccumulates in both plants and animals. Zinc also bioaccumulates in terrestrial plants, vertebrates, and mammals, with plant uptake from soil dependent on the plant species, soil pH, and soil composition. In general, zinc does not biomagnify through food chains.

The mobility of metals is media dependent. Most metals will bind with organic ligands, reducing their mobility in soil and water. Mobility in air is determined by particle size.

SECTION 13. DISPOSAL CONSIDERATIONS

If material cannot be returned to process or salvage, dispose of only in accordance with applicable regulations.

SECTION 14. TRANSPORT INFORMATION

PROPER SHIPPING NAME	Environmentally Hazardous Substance, Solid, n.o.s. (contains lead sulfide)
TRANSPORT CANADA HAZARD CLASS	9.2
U.S. DOT HAZARD CLASS	9
TRANSPORT CANADA AND US DOT PRODUCT IDENTIFICATION NUMBER	UN3077

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ZINC CONCENTRATE

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MARINE POLLUTANT
IMO CLASSIFICATION

No
MHB - Material Hazardous Only in Bulk

SECTION 15. REGULATORY INFORMATION

U.S.

HAZARDOUS UNDER HAZARD COMMUNICATION STANDARD

Lead Sulfide Y

INGREDIENTS LISTED ON TSCA INVENTORY

Y

CERCLA SECTION 103 HAZARDOUS SUBSTANCES

Lead Sulfide RQ: 10 pounds
Zinc Compounds RQ: None assigned

EPCRA SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCE

None of the ingredients qualify

EPCRA SECTION 311/312 HAZARD CATEGORIES

Delayed (chronic) Health Hazard - Carcinogen

EPCRA SECTION 313 TOXIC RELEASE INVENTORY

Lead Compounds Percent by Weight: 1 to 2
Zinc Compounds Percent by Weight: 89 to 97

CALIFORNIA PROPOSITION 65:

This product contains lead compounds, chemicals known to the State of California to cause cancer and reproductive toxicity.

CANADIAN:

WHMIS CLASSIFICATION:

Controlled Product, Classification D2A
This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

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ZINC CONCENTRATE

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SECTION 16. OTHER INFORMATION

The information in this Material Safety Data Sheet is based on the following references:

American Conference of Governmental Industrial Hygienists, 1991, Documentation of the Threshold Limit Values and Biological Exposure Indices, Sixth Edition (Lead Revision 1995).

American Conference of Governmental Industrial Hygienists, 1996, Guide to Occupational Exposure Values.

American Conference of Governmental Industrial Hygienists, 1996, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices - 1995-1996.

Clayton and Clayton, 1994, Patty's Industrial Hygiene and Toxicology, Fourth Edition.

European Economic Community, Commission Directives 91/155/EEC and 67/548/EEC.

Industry Canada, SOR/88-66, as amended, Controlled Products Regulations.

Lewis, Richard J., Sr., 1991, Hazardous Chemicals Desk Reference, Second Edition.

Merck & Co., Inc., 1989, The Merck Index, An Encyclopedia of Chemicals, Drugs, and Biologicals, Eleventh Edition.

National Library of Medicine, National Toxicology Information Program, 1996, Hazardous Substance Data Bank.

Sax, N. Irving, 1984, Dangerous Properties of Industrial Materials, Sixth Edition.

U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, 1993, Toxicological Profile for Lead.

U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, 1995, Update Toxicological Profile for Silica.

U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, 1994, Update Toxicological Profile for Zinc.

U.S. Environmental Protection Agency, Online Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, 1996, Integrated Risk Information System.

U.S. Occupational Safety and Health Administration, 1989, Code of Federal Regulations, Title 29, Part 1910.

Notice to Reader

Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. Teck Cominco Metals Ltd. extends no warranty and assumes no responsibility for the accuracy of the content and expressly disclaims all liability for reliance thereon. This material safety data sheet provides guidelines for the safe handling and processing of this product; it does not and cannot advise on all possible situations, therefore, your specific use of this product should be evaluated to determine if additional precautions are required. Individuals exposed to this product should read and understand this information and be provided pertinent training prior to working with this product.

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ZINC SULPHATE

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2495621

PRODUCT NAME(S) : Zinc Sulphate

PRODUCT IDENTIFICATION : Code LA3038

DATE OF MSDS : 1999-05-06

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-12-20

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : VAN WATERS & ROGERS LTD

ADDRESS : 9800 Van Horne Way
Richmond British Columbia
Canada V6X 1W5

EMERGENCY TELEPHONE NO. : 800-424-9300 (CHEMTREC)

*** MATERIAL SAFETY DATA ***

Zinc Sulphate LA3038 1 99-05-06EEE

LA3038.1 Zinc Sulphate

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VAN WATERS & ROGERS LTD. 9800 VAN HORNE WAY RICHMOND, B C. V6X 1W5

WHMIS CODES: D.2B

For Emergency Assistance
Involving Chemicals Call
CHEMTREC (800) 424-9300

WHMIS (Classification)

**WHMIS CLASS D-2B: Material causing
other toxic effects (TOXIC).**

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ZINC SULPHATE

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****Section I. Chemical Product Identification****

Product Name	Zinc Sulphate	Code	LA3038
		CAS#	007733020
Synonym	Not available.	DSL	On the DSL list.
Chemical Name	Zinc sulphate	CI#	Not available.
Chemical Family	Not available.		
Chemical Formula	O4SZN		
Material Uses	Not available.		

****Section II. Composition and Information on Ingredients****

				Exposure Limits	
Name	CAS #	% by Weight	TLV/PEL	LC50/LD50	
Zinc Sulphate	007733020	100	Not available.	ORAL (LD50): Acute: 2949 mg/kg [Rat].	

****Section III. Hazards Identification****

Potential Acute Health Effects	Hazardous in case of eye contact (irritant), of ingestion. Slightly hazardous in case of skin contact (irritant), of inhalation. Severe over-exposure can result in death.
Potential Chronic Health Effects	Hazardous in case of skin contact (irritant). CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

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ZINC SULPHATE

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****Section IV. First Aid Measures****

Eye Contact	Check for and remove any contact lenses. IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. COLD water may be used. DO NOT use an eye ointment. Seek medical attention.
Skin Contact	After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. COLD water may be used. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.
Hazardous Skin Contact	No additional information.
Inhalation	Allow the victim to rest in a well-ventilated area. Seek immediate medical attention.
Hazardous Inhalation	No additional information.
Ingestion	DO NOT induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.
Hazardous Ingestion	No additional information.

****Section V. Fire and Explosion Data****

The Product is:	Non-flammable.
Auto-Ignition Temperature	Not applicable.
Flash Points	Not applicable.
Flammable Limits	Not applicable.
Products of Combustion	Not applicable.

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ZINC SULPHATE

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Fire Hazards in Not applicable.
Presence of
Various
Substances

Explosion Risks of explosion of the product in presence of
Hazards in mechanical impact: Not available.
Presence of Risks of explosion of the product in presence of static
Various discharge: Not available.
Substances No specific information is available in our database
regarding the product's risks of explosion in the
presence of various materials.

Fire Fighting Not applicable.
Media
and
Instructions

Special Remarks No additional remark.
on
Fire Hazards

Special Remarks No additional remark.
on Explosion
Hazards

****Section VI. Accidental Release Measures****

Small Spill Use appropriate tools to put the spilled solid in a
convenient waste disposal container. Finish cleaning by
spreading water on the contaminated surface and dispose
of according to local and regional authority
requirements.

Large Spill Our database contains no additional information in case
of a spill and/or a leak of the product. Use a shovel to
put the material into a convenient waste disposal
container.

****Section VII. Handling and Storage****

Precautions Keep locked up. DO NOT ingest. DO NOT breathe dust.
Avoid contact with eyes. Wear suitable protective
clothing. If ingested, seek medical advice immediately
and show the container or the label. Keep away from
incompatibles such as oxidizing agents, acids, moisture.

Storage Keep container tightly closed. Keep in a cool and well-
ventilated area. Highly toxic or infectious materials
should be stored in a separate locked safety storage

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ZINC SULPHATE

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cabinet or room.

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

Engineering Controls	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal Protection	Splash goggles. Lab coat. Dust respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Gloves.
Personal Protection in Case of a Large Spill	Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits	Not available.

****Section IX. Physical and Chemical Properties****

Physical State and Appearance	Solid. (Crystals solid.)	Odor	Not available.
Molecular Weight	161.43 g/mole	Taste	Not available.
pH (1% soln/water)	Not available.	Color	Colorless.
Boiling Point	>500 C (932 F)		
Melting Point	100 C (212 F)		
Critical Temperature	Not available.		
Specific Gravity	1.97 (Water = 1)		
Vapor Pressure	Not available.		
Vapor Density	Not available.		
Volatility	Not available.		
Odor Threshold	Not available.		
Evaporation	Not available.		

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ZINC SULPHATE

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rate

Viscosity Not available.

Water/Oil Dist. Not available.
Coeff.

Ionicity (in Not available.
Water)

Dispersion See solubility in water.
Properties

Solubility Easily soluble in cold water.

****Section X. Stability and Reactivity Data****

Stability The product is stable.

Instability Not available.
Temperature

Conditions of No additional remark.
Instability

Incompatibility Reactive with oxidizing agents, acids, moisture.
with various
substances

Corrosivity No specific information is available in our database
regarding the corrosivity of this product in presence of
various materials.

Special Remarks Hazardous Decomposition Products: May liberate toxic
on fumes of zinc oxides and oxides of sulfur.
Reactivity

Special Remarks No additional remark.
on
Corrosivity

Hazardous No.
Polymerization

****Section XI. Toxicological Information****

Routes of Entry Eye contact. Ingestion.

Toxicity to Acute oral toxicity (LD50): 2949 mg/kg [Rat].
Animals

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ZINC SULPHATE

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Chronic Effects on Humans Hazardous in case of skin contact (irritant).
 CARCINOGENIC EFFECTS: Not available.
 MUTAGENIC EFFECTS: Not available.
 TERATOGENIC EFFECTS: Not available.
 DEVELOPMENTAL TOXICITY: Not available.
 Repeated exposure to an highly toxic material may produce
 general deterioration of health by an accumulation in one
 or many human organs.

Other Toxic Effects on Humans Hazardous in case of eye contact (irritant), of
 ingestion. Slightly hazardous in case of skin contact
 (irritant), of inhalation. Severe over-exposure can
 result in death.

Special Remarks on Toxicity to Animals No additional remark.

Special Remarks on Chronic Effects on Humans Passes through the placental barrier in animal.

Special Remarks on Other Toxic

Effects on
 Humans

****Section XII. Ecological Information****

Ecotoxicity Not available.

BOD5 and COD Not available.

Products of Biodegradation Possibly hazardous short term degradation products are
 not likely. However, long term degradation products may
 arise.

Toxicity of the Products of Biodegradation The products of degradation are less toxic than the
 product itself.

Special Remarks on the Products of Biodegradation No additional remark.

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ZINC SULPHATE

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****Section XIII. Disposal Considerations****

Waste Disposal Recycle, if possible. Consult your local or regional
 authorities.

****Section XIV. Transport Information****

TDG TDG CLASS 9.2: Environmentally hazardous material.
Classification

Shipping name Zinc sulphate

PIN NA9161

Packing Group III

Special No additional remark.
Provisions for
Transport

****Section XV. Other Regulatory Information****

Other Our database contains no special consideration on the
Regulations product.

****Section XVI. Other Information****

References Not available.

Other Special No additional remark.
Considerations

Verified by Hardev Bendick.

Validated by Hardev Bendick on
3/16/1999.

Information EH&S Department
Contact Vancouver, B C.
 (604) 273-1441

FOR UPDATED COPIES OF AN MSDS, PLEASE CONTACT YOUR LOCAL VAN WATERS
& ROGERS LTD. BRANCH.

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ZINC SULPHATE

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===== END OF MSDS =====

Appendix 3

Nunavut Consolidation of Spill Contingency Planning And Reporting Regulations

ENVIRONMENTAL PROTECTION ACT

**CONSOLIDATION OF SPILL
CONTINGENCY PLANNING AND
REPORTING REGULATIONS**

R-068-93

AS AMENDED BY

This consolidation is not an official statement of the law. It is an office consolidation prepared for convenience of reference only. The authoritative text of regulations can be ascertained from the *Revised Regulations of the Northwest Territories, 1990* and the monthly publication of Part II of the *Northwest Territories Gazette* (for regulations made before April 1, 1999) and Part II of the *Nunavut Gazette* (for regulations made on or after April 1, 1999).

LOI SUR LA PROTECTION DE
L'ENVIRONNEMENT

**CODIFICATION ADMINISTRATIVE
REGLEMENT SUR LES
EXIGENCES
E N M A T I E R E D E
DEVERSEMENTS**

R-068-93

MODIFIÉ PAR

La présente codification administrative ne constitue pas le texte officiel de la loi; elle n'est établie qu'à titre documentaire. Seuls les règlements contenus dans les *Règlements révisés des Territoires du Nord-Ouest (1990)* et dans les parutions mensuelles de la Partie II de la *Gazette des Territoires du Nord-Ouest* (dans le cas des règlements pris avant le 1^{er} avril 1999) et de la Partie II de la *Gazette du Nunavut* (dans le cas des règlements pris depuis le 1^{er} avril 1999) ont force de loi.

SPILL CONTINGENCY PLANNING AND REPORTING REGULATIONS

The Commissioner, on the recommendation of the Minister, under section 34 of the *Environmental Protection Act* and every enabling power, makes the *Spill Contingency Planning and Reporting Regulations*.

1. In these regulations,

"above ground facility" means a facility that is stationary for a period of 30 days or more and is not an underground facility; (*installation en surface*)

"Act" means the *Environmental Protection Act*; (*Loi*)

"facility" means any thing capable of storing or containing contaminants and includes any thing used in the transfer of contaminants to and from the facility; (*installation*)

"PCB" means the chlorobiphenyls that have the molecular formula $C_{12}H_{10-N}Cl_N$ in which N is greater than 2; (*BPC*)

"spill" means a discharge of a contaminant in contravention of the Act or regulations made under the Act or a permit or licence issued under the Act or regulations made under the Act; (*déversement*)

"storage capacity" means the aggregate capacity of all facilities placed together in one location; (*capacité d'entreposage*)

"TDGA Class" means a class of dangerous goods set out in the Schedule to the *Transportation of Dangerous Goods Act, 1992* (Canada), and any division of a class established in regulations made or continued under that Act; [*classe (LTMD)*]

"underground facility" means a facility having more than 10% of its structure beneath ground level. (*installation souterraine*)

RÈGLEMENT SUR LES EXIGENCES EN MATIÈRE DE DÉVERSEMENTS

Le commissaire, sur la recommandation du ministre, en vertu de l'article 34 de la *Loi sur la protection de l'environnement* et de tout pouvoir habilitant, prend le *Règlement sur les exigences en matière de déversements*.

1. Les définitions qui suivent s'appliquent au présent règlement.

«BPC» Désigne tout biphenyle polychloré caractérisé par la structure moléculaire $C_{12}H_{10-N}Cl_N$, où N est supérieur à 2. (*PCB*)

«capacité d'entreposage» Capacité d'entreposage de l'ensemble des installations réunies en un lieu. (*storage capacity*)

«classe (LTMD)» Classe de marchandises dangereuses prévue à l'annexe de la *Loi de 1992 sur le transport des marchandises dangereuses* (Canada), ou toute division d'une classe établie par un règlement pris ou maintenu en vertu de cette loi. (*TDGA Class*)

«déversement» Rejet de tout contaminant en contravention de la Loi ou de ses règlements ou en contravention d'un permis ou d'une licence délivré en vertu de la Loi ou de ses règlements. (*spill*)

«installation» Désigne tout objet dans lequel il est possible d'entreposer des contaminants ou qui peut contenir des contaminants, et comprend tout objet utilisé dans le transfert de contaminants en provenance ou à destination de l'installation. (*facility*)

«installation en surface» Désigne toute installation qui demeure stationnaire pendant 30 jours ou plus et qui n'est pas une installation souterraine. (*above ground facility*)

«installation souterraine» Toute installation dont plus de 10 % de la structure est située sous le niveau du sol. (*underground facility*)

2. (1) Sections 3 to 8 of these regulations do not apply to the following:

- (a) a motor vehicle, as defined in the *Motor Vehicles Act*, unless that motor vehicle is an above ground facility;
- (b) sewage and sewage sludge.

(2) Contaminants used solely for domestic purposes and discharged from within a dwelling-house are exempt from the requirements of these regulations.

(3) In Schedule A, the amounts set out in column 3 under the heading "STORAGE CAPACITY" refer to liquids, where the amount is expressed in litres, and to solids, where the amount is expressed in kilograms.

(4) In Schedule B, the amounts set out in column 4 under the heading "AMOUNT SPILLED" refer to liquids, where the amount is expressed in litres, and to solids, where the amount is expressed in kilograms.

SPILL CONTINGENCY PLAN

3. (1) No person shall store contaminants in a facility where the storage capacity of the facility equals or exceeds the storage capacity shown in Schedule A unless a spill contingency plan has been prepared and filed in accordance with these regulations.

(2) Where the storage capacity of a facility is less than the storage capacity shown in Schedule A and where, in the opinion of the Chief Environmental Protection Officer a spill contingency plan is necessary for the protection of the environment, the Chief Environmental Protection Officer may require the owner or person in charge, management or control of a facility to prepare a spill contingency plan.

(3) Where the Chief Environmental Protection Officer is satisfied, on reasonable grounds, that a person uses a means of storing contaminants and a

«Loi» *La Loi sur la protection de l'environnement.*
(Act)

2. (1) Les articles 3 à 8 du présent règlement ne s'appliquent pas :

- a) à un véhicule automobile au sens de la *Loi sur les véhicules automobiles*, à moins que le véhicule automobile ne soit une installation en surface;
- b) aux eaux usées ni aux boues d'épuration.

(2) Le présent règlement ne s'applique pas aux contaminants utilisés uniquement à des fins domestiques dont le rejet provient de l'intérieur d'une maison d'habitation.

(3) Les quantités prévues à la troisième colonne de l'annexe A, sous l'intertitre «CAPACITÉ D'ENTREPOSAGE», visent les matières liquides lorsque la mesure se fait en litres, et les matières solides lorsque la mesure se fait en kilogrammes.

(4) Les quantités prévues à la quatrième colonne de l'annexe B, sous l'intertitre «QUANTITÉ DÉVERSÉE», visent les matières liquides lorsque la mesure se fait en litres, et les matières solides lorsque la mesure se fait en kilogrammes.

PLAN DE CONTRÔLE DES DÉVERSEMENTS

3. (1) Il est interdit d'entreposer des contaminants dans une installation dont la capacité d'entreposage est égale ou supérieure à celle indiquée à l'annexe A, à moins d'avoir établi un plan de contrôle des déversements et de l'avoir soumis en conformité avec le présent règlement.

(2) Dans le cas où la quantité de contaminants entreposés est inférieure à la capacité d'entreposage indiquée à l'annexe A, le directeur de la protection de l'environnement peut exiger du propriétaire ou du responsable d'une installation l'établissement d'un plan de contrôle des déversements, si le directeur est d'avis qu'un tel plan est nécessaire aux fins de protection de l'environnement.

(3) S'il est convaincu, pour des motifs raisonnables, que la méthode qu'utilise une personne pour l'entreposage des contaminants et celle qu'elle

method of dealing with the spill of contaminants, that provide a level of environmental protection at least equivalent to that which would be provided by compliance with these regulations, the Chief Environmental Protection Officer may, in writing, subject to such conditions as the Chief Environmental Protection Officer considers necessary,

- (a) exempt a person from the requirement to file a spill contingency plan under subsection (1); or
- (b) exempt a person from the requirement to include in a spill contingency plan information required in one or more of paragraphs 4(2)(a) to (j).

4. (1) The owner or person in charge, management or control of a facility shall ensure that a spill contingency plan is prepared.

(2) A spill contingency plan for a facility must contain the following information:

- (a) the name, address and job title of the owner or person in charge, management or control;
- (b) the name, job title and 24-hour telephone number for the persons responsible for activating the spill contingency plan;
- (c) a description of the facility including the location, size and storage capacity;
- (d) a description of the type and amount of contaminants normally stored at the location described in paragraph (c);
- (e) a site map of the location described in paragraph (c);
- (f) the steps to be taken to report, contain, clean up and dispose of contaminants in the case of a spill;
- (g) the means by which the spill contingency plan is activated;
- (h) a description of the training provided to employees to respond to a spill;
- (i) an inventory of and the location of response and clean-up equipment available to implement the spill contingency plan;
- (j) the date the contingency plan was prepared.

utilise pour faire face au déversement de contaminants offrent un degré de protection de l'environnement qui n'est pas inférieur à celui exigé en application du présent règlement, le directeur de la protection de l'environnement peut par écrit, sous réserve des autres conditions qu'il estime nécessaires :

- a) soit soustraire cette personne de l'obligation de soumettre un plan de contrôle des déversements en vertu du paragraphe (1);
- b) soit soustraire cette personne de l'obligation d'inclure au plan de contrôle des déversements l'un ou l'autre des renseignements prévus aux alinéas 4(2)a) à j).

4. (1) Le propriétaire ou le responsable d'une installation doit faire en sorte qu'un plan de contrôle des déversements soit établi.

(2) Le plan de contrôle des déversements applicable à une installation fait état des renseignements suivants :

- a) le nom, l'adresse et le poste du propriétaire ou du responsable;
- b) le nom et le poste des responsables de la mise en oeuvre du plan de contrôle des déversements, ainsi que le numéro de téléphone où ils peuvent être rejoints 24 heures par jour;
- c) la description de l'installation, notamment le lieu, les dimensions et la capacité d'entreposage;
- d) la nature des contaminants habituellement entreposés dans l'installation mentionnée à l'alinéa c), ainsi que la quantité de contaminants qui y sont habituellement entreposés;
- e) une carte du lieu mentionné à l'alinéa c);
- f) la procédure de rapport, ainsi que les mesures de confinement, de nettoyage et d'élimination prévues en cas de déversement;
- g) la procédure de mise en oeuvre du plan de contrôle des déversements;
- h) la description de la formation donnée aux employés en matière de mesures à prendre en cas de déversement;
- i) l'inventaire et le lieu d'entreposage de

l'équipement de nettoyage et de mise en oeuvre du plan de contrôle des déversements;

j) la date d'établissement du plan de contrôle des déversements.

5. (1) Subject to subsection (2), the person responsible for preparing a spill contingency plan shall file the plan with the Chief Environmental Protection Officer before making use of a facility.

(2) Where a facility is already in use on the day these regulations come into force, the person responsible for preparing a spill contingency plan shall file the plan with the Chief Environmental Protection Officer within one year after that day.

6. (1) The Chief Environmental Protection Officer shall review each spill contingency plan after it is filed.

(2) The Chief Environmental Protection Officer may require the person who filed the spill contingency plan to make changes to it.

(3) Where the Chief Environmental Protection Officer requires changes under subsection (2), he or she may indicate a reasonable period of time within which the changes must be filed.

(4) The person who filed a spill contingency plan shall make and file any changes required under subsection (2).

7. (1) The person responsible for preparing a spill contingency plan shall review the plan annually.

(2) The person responsible for preparing a spill contingency plan shall, in writing, notify the Chief Environmental Protection Officer when a review under subsection (1) has been completed and shall immediately file with the Chief Environmental Protection Officer any changes made to the plan.

8. Once a spill contingency plan has been filed, the

5. (1) Sous réserve du paragraphe (2), le responsable de l'établissement d'un plan de contrôle des déversements soumet le plan au directeur de la protection de l'environnement avant de faire usage d'une installation.

(2) Dans le cas où une installation est déjà en usage à la date d'entrée en vigueur du présent règlement, le responsable de l'établissement du plan de contrôle des déversements doit soumettre le plan au directeur de la protection de l'environnement dans l'année qui suit cette entrée en vigueur.

6. (1) Le directeur de la protection de l'environnement révisé chaque plan de contrôle des déversements qui lui est soumis.

(2) Le directeur de la protection de l'environnement peut exiger que la personne qui soumet un plan de contrôle des déversements y apporte des modifications.

(3) Dans le cas où le directeur de la protection de l'environnement exige, en vertu du paragraphe (2), que des modifications soient apportées au plan de contrôle des déversements, il peut fixer un délai raisonnable pour la soumission de ces modifications.

(4) La personne qui soumet un plan de contrôle des déversements doit apporter et soumettre toute modification exigée en vertu du paragraphe (2).

7. (1) Le responsable de l'établissement d'un plan de contrôle des déversements doit le réviser annuellement.

(2) Le responsable de l'établissement d'un plan de contrôle des déversements doit aviser par écrit le directeur de la protection de l'environnement de la révision du plan en vertu du paragraphe (1), et lui soumettre immédiatement toute modification apportée au plan.

8. Après avoir soumis un plan de contrôle des

person responsible for preparing the plan shall implement the plan.

SPIILLS

9. (1) The owner or person in charge, management or control of contaminants at the time a spill occurs shall immediately report the spill where the spill is of an amount equal to or greater than the amount set out in Schedule B.

(2) Where there is a reasonable likelihood of a spill in an amount equal to or greater than the amount set out in Schedule B, the owner or person in charge, management or control of the contaminants shall immediately report the potential spill.

10. A person reporting a spill shall contact the 24 Hour Spill Report Line by calling **(867) 920-8130**.

11. (1) A person reporting a spill shall give as much of the following information as possible:

- (a) date and time of spill;
- (b) location of spill;
- (c) direction spill is moving;
- (d) name and phone number of a contact person close to the location of spill;
- (e) type of contaminant spilled and quantity spilled;
- (f) cause of spill;
- (g) whether spill is continuing or has stopped;
- (h) description of existing containment;
- (i) action taken to contain, recover, clean up and dispose of spilled contaminant;
- (j) name, address and phone number of person reporting spill;
- (k) name of owner or person in charge, management or control of contaminants at time of spill.

(2) No person shall delay reporting a spill because of lack of knowledge of any of the factors listed in subsection (1).

déversements, le responsable de l'établissement du plan le met en oeuvre.

DÉVERSEMENTS

9. (1) Lorsque survient le déversement d'une quantité de contaminants au moins égale à celles stipulées à l'annexe B, le propriétaire ou le responsable du contaminant au moment du déversement est tenu de le signaler sur-le-champ.

(2) Le propriétaire ou le responsable de contaminants a l'obligation de signaler sur-le-champ un déversement potentiel lorsqu'il est raisonnablement possible que la quantité déversée soit au moins égale à celle stipulée à l'annexe B.

10. La personne qui signale un déversement le fait à toute heure en téléphonant à SOS Déversement, au **(867) 920-8130**.

11. (1) La personne qui signale un déversement doit indiquer, dans la mesure du possible :

- a) la date et l'heure du déversement;
- b) le lieu du déversement;
- c) la direction dans laquelle le déversement s'étend;
- d) le nom et le numéro de téléphone d'une personne vivant à proximité des lieux du déversement et qui peut être contactée;
- e) la nature des contaminants et la quantité déversée;
- f) la cause du déversement;
- g) le fait que le déversement soit terminé ou non;
- h) les moyens de confinement déjà en place;
- i) les mesures prises pour confiner, ramasser et éliminer les contaminants et nettoyer les lieux;
- j) le nom, l'adresse et le numéro de téléphone de la personne qui signale le déversement;
- k) le nom du propriétaire ou celui du responsable des contaminants au moment du déversement.

(2) Il est interdit de retarder le signalement d'un déversement en raison d'un manque de connaissance des éléments d'information indiqués au paragraphe

12. No person shall knowingly make a false report of a spill or a potential spill.

13. (1) For the purposes of evaluating the effectiveness of the spill contingency plan, the Chief Environmental Protection Officer may require, in writing, the owner or person in charge, management or control of a facility at the time a spill occurred to prepare and file a written report concerning the spill.

(2) The person required to prepare the report described in subsection (1) shall provide all information required by the Chief Environmental Protection Officer.

(1).

12. Il est interdit de faire sciemment un faux signalement d'un déversement ou d'un déversement potentiel.

13. (1) Le directeur de la protection de l'environnement peut, à des fins d'évaluation de l'efficacité du plan de contrôle des déversements, exiger par écrit du propriétaire ou du responsable d'une installation au moment d'un déversement qu'il présente un rapport écrit relatif au déversement.

(2) La personne à qui le directeur de la protection de l'environnement demande de présenter un rapport sur un déversement doit fournir tous les renseignements exigés par le directeur.

SCHEDULE A			ANNEXE A		
(Section 3)			(article 3)		
(1)	(2)	(3)	(1)	(2)	(3)
ITEM NO.	TYPE OF FACILITY	STORAGE CAPACITY	N°	TYPE DE DÉPÔT	CAPACITÉ D'ENTRE-POSAGE
1.	Above ground facility	20,000 ℓ or 20,000 kg	1.	Installation en surface	20 000 l ou 20 000 kg
2.	Under-ground facility	4,000 ℓ or 4,000 kg	2.	Installation souterraine	4 000 l ou 4 000 kg

SCHEDULE B

(Section 9)

(1)	(2)	(3)	(4)
ITEM NO.	TDGA CLASS	DESCRIPTION OF CONTAMINANT	AMOUNT SPILLED
1.	1	Explosives	Any amount
2.	2.1	Compressed gas (flammable)	Any amount of gas from containers with a capacity greater than 100 ℓ
3.	2.2	Compressed gas (non-corrosive, non flammable)	Any amount of gas from containers with a capacity greater than 100 ℓ
4.	2.3	Compressed gas (toxic)	Any amount
5.	2.4	Compressed gas (corrosive)	Any amount
6.	3.1, 3.2, 3.3	Flammable liquid	100 ℓ
7.	4.1	Flammable solid	25 kg
8.	4.2	Spontaneously combustible solids	25 kg
9.	4.3	Water reactant solids	25 kg
10.	5.1	Oxidizing substances	50 ℓ or 50 kg
11.	5.2	Organic Peroxides	1 ℓ or 1 kg
12.	6.1	Poisonous substances	5 ℓ or 5 kg

ANNEXE B

(article 9)

(1)	(2)	(3)	(4)
N°	CLASSE (LTMD)	CONTAMINANT	QUANTITÉ DÉVERSÉE
1.	1	Explosif	Toute
2.	2.1	Gaz comprimé (inflammable)	Toute quantité de gaz provenant d'un conte- nant d'une capacité supérieure à 100 l
3.	2.2	Gaz comprimé (non corrosif, ininflammable)	Toute quantité de gaz provenant d'un conte- nant d'une capacité supérieure à 100 l
4.	2.3	Gaz comprimé (toxique)	Toute
5.	2.4	Gaz comprimé (corrosif)	Toute
6.	3.1, 3.2, 3.3	Liquide inflammable	100 l
7.	4.1	Solide inflammable	25 kg
8.	4.2	Solide sujet à l'in- flammation spontanée	25 kg
9.	4.3	Solide réagissant au contact de l'eau	25 kg
10.	5.1	Matière comburante	50 l ou 50 kg
11.	5.2	Peroxyde organique	1 l ou 1 kg
12.	6.1	Matière toxique	5 l ou 5 kg

13.	6.2	Infectious substances	Any amount
14.	7	Radioactive	Any amount
15.	8	Corrosive substances	5 ℓ or 5 kg
16.	9.1 (in part)	Miscellaneous products or substances, excluding PCB mixtures	50 ℓ or 50 kg
17.	9.2	Environmentally hazardous	1 ℓ or 1 kg
18.	9.3	Dangerous wastes	5 ℓ or 5 kg
19.	9.1 (in part)	PCB mixtures of 5 or more parts per million	0.5 ℓ or 0.5 kg
20.	None	Other contaminants	100 ℓ or 100 kg

13.	6.2	Matière infectieuse	Toute
14.	7	Matière radioactive	Toute
15.	8	Matière corrosive	5 l ou 5 kg
16.	9.1 (en partie)	Matière diverse ou produit divers (mélanges contenant des BPC exclus)	50 l ou 50 kg
17.	9.2	Matière nocive pour l'environnement	1 l ou 1 kg
18.	9.3	Déchet toxique	5 l ou 5 kg
19.	9.1 (en partie)	Mélange contenant 5 parties ou plus de BPC par million	0,5 l ou 0,5 kg
20.	Aucune	Autre contaminant	100 l ou 100 kg
