Appendix F
Material Safety Data Sheets

MATERAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Trade Name:	OATEY CANADIAN STANDARD ABS YELLOW CEMENT
Product Use:	Cement for ABS Plastic Pipe
Formula:	ABS Resin in Solvent Solution
Synonyms:	ABS Plastic Pipe Cement
Firm Name & Mailing Address:	OATEY CO. 4700 West 160th Street P.O. Box 35906 Cleveland, Ohio 44135, U.S.A. http://www.oatey.com
Oatey Phone Number:	(216) 267-7100 or (800) 321-9532
Emergency Phone Numbers:	For Emergency First Aid call 1-303-623-5716 COLLECT. For chemical transportation emergencies ONLY, call Chemtrec at 1-800-424-9300. Outside the U.S. 1-703-527-3887.
Prepared By:	Corporate Director - Safety and Environmental Compliance
Preparation Date:	May 9, 2005

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENTS:	%wt/wt:	CAS NUMBER:	ACGIH TLV TWA:	OSHA PEL TWA:	OTHER:
Methyl Ethyl Ketone	60 - 75%	78-93-3	200 ppm 300 ppm STEL	200 ppm	None
ABS Resin (Non-hazardous)	25 - 40%	9003-56-9	None Established	None Established	None
Yellow Colorant (Non-hazardous)	0.1 - 1%	Not Available	None Established	None Established	None

OSHA Hazard Classification: Flammable, irritant, organ effects

SECTION 3 HAZARDS IDENTIFICATION

Emergency Overview:
Yellow liquid with an ether-like odor. Extremely flammable liquid and vapor. Vapors may cause flash fire. May cause eye and skin irritation. Inhalation of vapors or mist may cause respiratory irritation and central nervous system effects. Swallowing may cause irritation, nausea, vomiting or diarrhea. Aspiration hazard. May be fatal if swallowed. Symptoms may be delayed.

SECTION 4 FIRST AID MEASURES

CALL 1-303-623-5716 COLLECT

Skin: Remove contaminated clothing immediately. Wash all exposed areas with soap and water. Get medical attention if irritation develops. Remove dried cement with Oatey Plumber's Hand Cleaner or baby oil.

Eyes: If material gets into eyes or if fumes cause irritation, immediately flush eyes with plenty of water until chemical is removed. If irritation persists, get medical attention immediately.

Inhalation: If symptoms of exposure develop, remove to fresh air. If breathing becomes difficult, administer oxygen. Administer artificial respiration if breathing has stopped. Seek immediate medical attention.

Ingestion: **DO NOT INDUCE VOMITING.** Rinse mouth with water. Never give anything by mouth to a person who is unconscious or drowsy. Get immediate medical attention by calling a Poison Control Center, or hospital emergency room. If medical advice cannot be obtained, then take the person and product to the nearest medical emergency treatment center or hospital.

SECTION 5 FIRE FIGHTING MEASURES

Flashpoint / Method:	20 - 30 Degrees F. (-7 - -1 Degrees C) / PMCC
Flammability:	LEL = 1.8 % Volume, UEL = 11.8 % Volume
Extinguishing Media:	Use dry chemical, CO2, or foam to extinguish fire. Cool fire exposed container with water. Water may be ineffective as an extinguishing agent.
Special Fire Fighting Procedure:	Firefighters should wear positive pressure self-contained breathing apparatus and full protective clothing for fires in areas where chemicals are used or stored.
Unusual Fire and Explosion Hazards:	Extremely flammable liquid. Keep away from heat and all sources of ignition including sparks, flames, lighted cigarettes and pilot lights. Containers may rupture or explode in the heat of a fire. Vapors are heavier than air and may travel to a remote ignition source and flash back.
Hazardous Decomposition Products:	Combustion will produce toxic and irritating vapors including carbon monoxide and carbon dioxide.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Spill or Leak Procedures:	Remove all sources of ignition and ventilate area. Stop leak if it can be done without risk. Personnel cleaning up the spill should wear appropriate personal protective equipment, including respirators if vapor concentrations are high. Soak up spill with an inert absorbent such as sand, earth or other non-combusting material. Put absorbent material in covered, labeled metal containers. Prevent liquid from entering watercourses, sewers and natural waterways. Report releases to authorities as required. See Section 13 for disposal information.

SECTION 7 HANDLING AND STORAGE

Handling:	Avoid contact with eyes, skin and clothing. Avoid breathing vapors or mists. Use with adequate ventilation (equivalent to outdoors). Wash thoroughly after handling. Do not eat, drink or smoke in the work area. Keep product away from heat, sparks, flames and all other sources of ignition. No smoking in storage or use areas. Keep containers closed when not in use.
Storage:	Store in a cool, dry, well-ventilated area away from incompatible materials. Keep containers closed when not in use.
Other:	"Empty" containers retain product residue and can be hazardous. Follow all MSDS precautions in handling empty containers. Do not cut or weld on or near empty or full containers.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation:	Open doors & windows. Provide ventilation capable of maintaining emissions at the point of use below recommended exposure limits. If used in enclosed area, use exhaust fans. Exhaust fans should be explosion-proof or set up in a way that flammable concentrations of solvent vapors are not exposed to electrical fixtures or hot surfaces.

SECTION 8 (Continued)

Respiratory Protection:	For operations where the exposure limit may be exceeded, a NIOSH approved organic vapor respirator or supplied air respirator is recommended. Equipment selection depends on contaminant type and concentration, select in accordance with 29 CFR 1910.134 and good industrial hygiene practice. For firefighting, use self-contained breathing apparatus.
Skin Protection:	Rubber gloves are suitable for normal use of the product. For long exposures chemical resistant gloves may be required such as 4H(tm) or Silver Shield(tm) to avoid prolonged skin contact.
Eye Protection:	Safety glasses with side shields or safety goggles.
Other:	Eye wash and safety shower should be available.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point:	176 Degrees F / 80 Degrees C
Melting Point:	Not applicable
Vapor Pressure:	100 mmHg @ 20 Degrees C
Vapor Density:	(Air = 1) 2.5
Volatile Components:	65-75%
Solubility In Water:	Negligible
pH:	Not applicable
Specific Gravity:	0.87 +/- 0.02 @ 20 Degrees C
Evaporation Rate:	(BUAC = 1) = 2.7
Appearance:	Yellow Liquid
Odor:	Ether-Like
Will Dissolve In:	Acetone or Methyl Ethyl Ketone
Material Is:	Liquid

SECTION 10 STABILITY AND REACTIVITY

Stability:	Stable.
Conditions To Avoid:	Avoid heat, sparks, flames and other sources of ignition.
Hazardous Decomposition Products:	Combustion will produce toxic and irritating vapors including carbon monoxide and carbon dioxide.
Incompatibility/ Materials To Avoid:	Oxidizing agents, alkalis, amines, ammonia, acids, chlorine compounds, chlorinated inorganics (potassium, calcium and sodium hypochlorite) and hydrogen peroxides. May attack plastic, resins and rubber.
Hazardous Polymerization:	Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Inhalation:	Vapors or mists may cause mucous membrane and respiratory irritation, coughing, headache, dizziness, dullness, nausea, shortness of breath and vomiting. High concentrations may cause central nervous system depression, narcosis and unconsciousness. May cause lung damage.
Skin:	May cause irritation with redness, itching and pain. Methyl ethyl ketone may be absorbed through the skin causing effects similar to those listed under inhalation.
Eye:	Vapors may cause irritation. Direct contact may cause irritation with redness, stinging and tearing of the eyes. May cause eye damage.

SECTION 11 (Continued)

Ingestion:	Swallowing may cause abdominal pain, nausea, vomiting and diarrhea. Aspiration during swallowing or vomiting can cause chemical pneumonia and lung damage.
Chronic Toxicity:	Prolonged or repeated overexposure cause dermatitis and damage to the lungs and central nervous system.
Toxicity Data:	Methyl Ethyl Ketone: Oral rat LD50: 2,737 mg/kg Inhalation rat LC50: 23,500 mg/m3/8 hours Skin rabbit LD50: 6,480 mg/kg
Sensitization:	None of the components are known to cause sensitization.
Carcinogenicity:	None of the components are listed as a carcinogen or suspect carcinogen by NTP, IARC or OSHA.
Mutagenicity:	Methyl ethyl ketone is generally thought not to be mutagenic.
Reproductive Toxicity:	Methyl ethyl ketone has been shown to cause embryofetal toxicity and birth defects in laboratory animals.
Medical Conditions Aggravated By Exposure:	Persons with pre-existing skin or lung disorders may be at increased risk from exposure to this product.

SECTION 12 ECOLOGICAL INFORMATION

This product is not expected to be toxic to aquatic organisms.
Methyl Ethyl Ketone: 96 hour LC50 for fish is greater than 100 mg/L.

VOC Information:	This product emits VOC's (volatile organic compounds) in its use. Make sure that use of this product complies with local VOC emission regulations, where they exist.
VOC Level:	600 g/l per SCAQMD Test Method 316A.

SECTION 13 DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose in accordance with current local, state and federal regulations.
RCRA Hazardous Waste Number: U159
EPA Hazardous Waste ID Number: D001, D035, F005
EPA Hazard Waste Class: Ignitable Waste. Toxic Waste (Methyl Ethyl Ketone content)

SECTION 14 TRANSPORT INFORMATION

DOT	Less than 1 Liter (0.3 gal)	Greater than 1 Liter (0.3 gal)
Proper Shipping Name:	Consumer Commodity	Adhesives
Hazard Class/Packing Group:	ORM-D	3, PGII
UN/NA Number:	None	UN1133
Hazard Labels:	None	Flammable Liquid
IMDG		
Proper Shipping Name:	Adhesives	Adhesives
Hazard Class/Packing Group:	3, II	3, II
UN Number:	UN1133	UN1133
Label:	None (Limited Quantities are excepted from labeling)	Class 3 (Flammable Liquid)

2004 North American Emergency Response Guidebook Number: 127 or 128

SECTION 15 REGULATORY INFORMATION

Hazard Category for Section 311/312: Acute Health, Flammable

Section 302 Extremely Hazardous Substances (TPQ): This product does not contain chemicals regulated under SARA Section 302.

Section 313 Toxic Chemicals: This product contains the following chemicals subject to SARA Title III Section 313 Reporting requirements:

Chemical	CAS #	% by wt.
Methyl Ethyl Ketone	78-93-3	60-75%

CERCLA 103 Reportable Quantity: Spills of this product over the RQ (reportable quantity) must be reported to the National Response Center. The RQ for the product, based on the RQ for Methyl Ethyl Ketone (75% maximum) of 5,000 lbs, is 6,666 lbs. Many states have more stringent release reporting requirements. Report spills required under federal, state and local regulations.

California Proposition 65: This product does not contain any chemicals subject To California Proposition 65 regulation.

TSCA Inventory: All of the components of this product are listed on the TSCA inventory.

Canadian WHIMS Classification: Class B, Division 2; Class D, Division 2, Subdivision A; Class D, Division 2, Subdivision B. This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

SECTION 16 OTHER INFORMATION

NFPA and HMIS:

NFPA Hazard Signal:	Health: 1	Flammability: 3	Reactivity: 0	Special: None
HMIS Hazard Signal:	Health: 2	Flammability: 3	Reactivity: 0	PPE: G

Disclaimer:
The information herein has been compiled from sources believed to be reliable, up-to-date, and is accurate to the best of our knowledge. However, Oatey cannot give any guarantees regarding information from other sources, and expressly does not make warranties, nor assumes any liability for its use.

Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name:	Acetylene	**Trade Name:**	Acetylene
Product Use:	Metal industry: Welding and cutting of metals.		
Chemical Name:	Acetylene	**Synonym:**	Acetylen, Ethine, Ethyne, Narcylene
Chemical Formula:	C_2H_2	**Chemical Family:**	Alkyne
Telephone:	**Emergencies:** * 1-800-363-0042	**Supplier /Manufacture:**	Praxair Canada Inc. 1 City Centre Drive Suite 1200 Mississauga, ON L5B 1M2
		Phone:	905-803-1600
		Fax:	905-803-1682

**Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier or Praxair sales representative.*

2. Composition and Information on Ingredients

INGREDIENTS	% (VOL)	CAS NUMBER	LD_{50} (Species & Routes)	LC_{50} (Rat, 4 hrs.)	TLV-TWA (ACGIH)
Acetylene	100	74-86-2	Not available.	Not available.	Simple asphyxiant.

3. Hazards Identification

Emergency Overview

DANGER! Flammable gas under pressure. Can form explosive mixtures with air. Fusible plugs in top, bottom, or valve melt at 98 - 104 C. Do not discharge at pressures above 103 kPa. May cause dizziness and drowsiness. Self-contained breathing apparatus may be required by rescue workers.

ROUTES OF EXPOSURE: Inhalation.

THRESHOLD LIMIT VALUE: TLV-TWA Data from 2004 Guide to Occupational Exposure Values (ACGIH). TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION:	Asphyxiant. Effects are due to lack of oxygen. Moderate concentrations may cause headaches, drowsiness, dizziness, excitation, excess salivation, vomiting, and unconciousness. The vapour from a liquid (acetone) release may also cause incoordination and abdominal pain. Lack of oxygen can kill.
SKIN CONTACT:	No harm expected. Liquid (acetone) may cause frostbite.
SKIN ABSORPTION:	No harm expected. Liquid (acetone) may cause frostbite.

SWALLOWING:

An unlikely route of exposure, but frostbite of the lips and mouth may result from contact with the liquid (acetone). If swallowed, the liquid may cause nausea.

EYE CONTACT:

Vapour containing acetone may cause irritation. Liquid (acetone) may cause irritation and frosbite.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE:
NOTE: Acetylene cylinders are filled with a porous material containg acetone into which the acetylene is dissolved. ACGIH has established a TLV-TWA of 500 ppm for acetone and a STEL of 750 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. Obtain a Material Safety Data Sheet (MSDS) for each 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, or 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 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 known.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
Repeated or prolonged exposure is not known to aggravate medical condition.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION:
None

CARCINOGENICITY:
Not listed as carcinogen by OSHA, NTP or IARC.

4. First Aid Measures

INHALATION:

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

SKIN CONTACT:

In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

SWALLOWING:

If liquid is swallowed, do not induce vomiting. Call a physician.

EYE CONTACT:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. See a physician, preferably an ophthalmologist, immediately.

NOTES TO PHYSICIAN:

Aspired 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.

5. Fire Fighting Measures

FLAMMABLE :	Yes.	IF YES, UNDER WHAT CONDITIONS?	See "Unusual Fire and Explosion Hazards" in this section.
FLASH POINT (test method)	CLOSED CUP: -17.8°C (0°F). (Tag)	AUTOIGNITION TEMPERATURE	305°C (581°F)
FLAMMABLE LIMITS IN AIR, % by volume:	LOWER: 2.5	UPPER:	100

EXTINGUISHING MEDIA:

See paragraphs below.

SPECIAL FIRE FIGHTING PROCEDURES:

DANGER! Refer to CGA safety bulletin SB-4, "Handling Acetylene Cyinders 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 accidently 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 HAZARD:

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. No part of a container should be subjected to temperature higher than 52 C. Most 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. Vapours form from this product and may travel or be moved by air currents and ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharges, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with approved device.

HAZARDOUS COMBUSTION PRODUCTS:

These products are carbon oxides (CO, CO2).

SENSITIVITY TO IMPACT:

Avoid impact against container.

SENSITIVITY TO STATIC DISCHARGE:

Possible, See Section 7.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

DANGER! **Flammable, high-pressure gas.** Forms explosive mixtures with air. Immediately evacaute all personnel from danger area. Use self-contained breathing apparatus where needed. Remove all sources of ignition if without risk. Reduce gas with fog or fine water spray. Shut off flow if without risk. Ventilate area or move cylinder to a well-ventilated area. Flammable gas may spread from leak. Before entering area, especially confined areas, check atmosphere with an appropriate device.

WASTE DISPOSAL METHOD:

Prevent waste from contaminating the 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. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN STORAGE:

Store and use with adequate ventilation. Separate flammable cylinders from oxygen, chlorine, and other oxidizers by at least 6.1 m or use a barricade of non-combustible material. This barricade should be at least 1.53 m high and have a fire resistance rating of at least ½ hour. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Post "No Smoking or Open Flames" signs in storage and use areas. There must be no sources of ignition. All electrical equipment in storage areas must be explosion-proof. Storage areas must meet national electric codes for Class 1 hazardous areas. Store only where temperature will not exceed 52 C. Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

PRECAUTIONS TO BE TAKEN IN HANDLING:

Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. All piped acetylene systems and associated equipment must be grounded. Electrical equipment must be non-sparking or explosion-proof. Leak check with soapy water; never use a flame. Never use copper piping for acetylene service; use only steel or wrought iron. Open acetylene cylinder valves the minimum amount required for acceptable flow; this will allow you to close valves as quickly as possible in an emergency. Do not open acetylene cylinder valves more than 1½ turns. Never use acetylene at pressures exceeding 103.5 kPa (15 psig). Acetylene cylinders are heavier than other cylinders because they are packed with a porous material and acetone. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Open valve slowly. If valve is hard to open, discontinue use and contact your supplier. For other precautions in using acetylene, see section 16.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE:

Flammable high-pressure gas. Use only in a closed system. Use piping and equipment adequately designed to withstand pressures to be encountered. Use only spark-proof tools and explosion-proof equipment. Keep away from heat, sparks, and open flame. ***May form explosive mixtures with air.*** Ground all equipment. ***Gas can cause rapid suffocation due to oxygen deficiency.*** Store and use with adequate ventilation. Close valve after each use; keep closed even when empty. ***Prevent reverse flow.*** *Reverse flow into cylinder may cause rupture. Use a check valve or other protective device in any line or piping from the cylinder.* ***When returning cylinder to supplier,*** *be sure valve is closed, then install valve outlet plug tightly.* ***Never work on a pressurized system.*** *If there is a leak, close the cylinder valve. Vent the system down in a safe and environmentally sound manner in compliance with all federal, provincial, and local laws; then repair the leak.* ***Never place a compressed gas cylinder where it may become part of an electrical circuit.***

8. Exposure Controls/Personal Protection

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST:	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. Train the worker to keep his head out of the fumes.
MECHANICAL (general):	Use a local exhaust system, if necessary, to maintain an adequate supply of oxygen in the worker's breathing zone.
SPECIAL:	Use only in a closed system.
OTHER:	Use local exhaust ventilation or handle in a ventilated enclosure.

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 (acetone) or the applicable TLVs for fumes, gases, and other by-products of welding with acetylene. 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
SKIN PROTECTION:	Welding gloves recommended.
EYE PROTECTION:	Wear safety glasses when handling cylinders. Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.
OTHER PROTECTIVE EQUIPMENT:	Metatarsal shoes for cylinder handling. Protective clothing where needed. Cuffless trousers should be worn outside the shoes. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines.

9. Physical and Chemical Properties

PHYSICAL STATE:	Gas.	FREEZING POINT:	-82.2°C (-116°F)	pH:	Not applicable.
BOILING POINT	-84°C (-119°F)	VAPOUR PRESSURE	4476.8 kPa (@ 20°C)	MOLECULAR WEIGHT:	26.04 g/mole
SPECIFIC GRAVITY: LIQUID (Water = 1)	Not applicable.	SOLUBILITY IN WATER,	Not applicable.		
SPECIFIC GRAVITY: VAPOUR (air = 1)	0.906	EVAPORATION RATE (Butyl Acetate=1):	Not applicable.	COEFFICIENT OF WATER/OIL DISTRIBUTION:	Not applicable.
VAPOUR DENSITY:	0.00117 g/ml @ 0 C	% VOLATILES BY VOLUME:	100% (v/v).	ODOUR THRESHOLD:	657 mg/m3
APPEARANCE & ODOUR:	Colourless.	Odour: Acetylene of 100% purity is odourless, but commercial acetylene has a distinctive garlic-like odour.			

10. Stability and Reactivity

STABILITY:	Unstable.
CONDITIONS OF CHEMICAL INSTABILITY:	Stable as shipped. Avoid use at pressure above 15 psig.
INCOMPATIBILITY (materials to avoid):	Avoid contact with copper, silver, mercury or their alloys, oxidizing agents, acids, halogens, moisture.
HAZARDOUS DECOMPOSITION PRODUCTS:	Thermal decomposition or burning may produce carbon monoxide/carbon dioxide. The welding and cutting process may form reaction products such as carbon monoxide and carbon dioxide.
HAZARDOUS POLYMERIZATION:	Will not occur.
CONDITIONS OF REACTIVITY:	

Elevated temperatures and pressures and/or presence of a catalyst.

11. Toxicological Information

See section 3.

12. Ecological Information

No adverse ecological effects expected. This product does not contain any Class I or Class II ozone-depleting chemicals. The components of this mixture are not listed as marine pollutants by TDG Regulations.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

14. Transport Information

TDG/IMO SHIPPING NAME: Acetylene, dissolved

HAZARD CLASS:	IDENTIFICATION #:	PRODUCT RQ:
CLASS 2.1: Flammable gas.	UN1001	100 L

SHIPPING LABEL(s): Flammable gas

PLACARD (when required): Flammable gas

SPECIAL SHIPPING INFORMATION:

Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of vehicle can present serious safety hazards.

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, provincial, and local regulations.

WHMIS (Canada)

CLASS A: Compressed gas.
CLASS B-1: Flammable gas.
CLASS F: Dangerously reactive material.

International Regulations

EINECS Not available.

DSCL (EEC) This product is not classified according to the EU regulations.

International Lists No products were found.

16. Other Information

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.

HAZARD RATING SYSTEM:

HMIS RATINGS:

HEALTH	2
FLAMMABILITY	4
PHYSICAL HAZARD	3

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED:	CGA-510, CGA-520, CGA-200
PIN-INDEXED YOKE:	None.
ULTRA-HIGH-INTEGRITY CONNECTION:	None.

Use the proper CGA connections. **DO NOT USE ADAPTERS.** Additional limited-standard connections may apply. See CGA pamphlets V-1 and V-7 listed below.

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information about this product can be found in the following pamphlets published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923, Telephone (703) 788-2700, Fax (703) 961-1831, website: www.cganet.com.

AV-1	Safe Handling and Storage of Compressed Gas
G-1	Acetylene
G-1.1	Commodity Specification for Acetylene
G-1.2	Recommendation for Chemical Acetylene Metering
G-1.3	Acetylene Transmission for Chemical Synthesis
P-1	Safe Handling of Compressed Gases in Containers
P-14	Accident Prevention in Oxygen-Rich, Oxygen-Deficient Atmosphere
SB-2	Oxygen-Deficient Atmospheres
V-1	Compressed Gas Cylinder Valve Inlet and Outlet Connections
V-7	Standard Method of Determining Cylinder Valve Outlet Connections for Industrial Gas Mixtures
---	Handbook of Compressed Gases, Fourth Edition

PREPARATION INFORMATION:

DATE:	**10/15/2004**
DEPARTMENT:	**Safety and Environmental Services**
TELEPHONE:	**905-803-1600**

The opinions expressed herein are those of qualified experts within Praxair Canada Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair Canada Inc., it is the user's obligation to determine the conditions of safe use of the product.

Praxair Canada Inc. requests the users of this product to study this Material 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 nformation, (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.

Praxair Canada Inc.
1 City Centre Drive
Suite 1200
Mississauga, ON L5B 1M2

Epsilon Chemicals Ltd.
1926-94 STREET NW
Edmonton, AB. T6N 1J3

Material Safety Data Sheet

Phone: 780-438-3040
In Case of Emergency Only:
Phone CANUTEC: 613-996-6666

Rec'd May 8/06

Product Name	Code	Date Completed
AB Handsoap	ECJ-150	23-Feb-06

WHMIS Classification	TDG Classification
Not Controlled	Not Controlled

HAZARDOUS INGREDIENTS	%WT/WT	CAS NO.	TOXICITY DATA (LD50 & LC50)
Ethanol	<1	64-17-5	
2,4,4'Trichloro-2'-hydroxydiphenyl ether	<1	3380-34-5	

PHYSICAL DATA FOR PRODUCT

Physical State	Vapour Pressure	Vapour Density
Liquid	Not Determined	N/A

pH	Evaporation Rate
6-7	N/A

Boiling Point (C)	Sp. Gravity	Freezing Point (C)	Solubility in Water
>100	1.0364	N/A	100%

Appearance and Odour
Clear viscous liquid, no apparent odour.

FIRE AND EXPLOSION DATA FOR PRODUCT

Fire Extinguishing Substances (√)

Water fog ✔ CO2 Other

✔ Foam ✔ Dry Chem

Detail:

Reactivity Data For Product

INCOMPATIBILITY (√)

Other ☐

Acid ☑ Base ☐ Water ☐ Oxidizing Material ☑

Detail:

Hazardous Decomposition Products
Upon decomposition, this product may yield oxides of sulphur, nitrogen and ammonia.

Chemical Stability
Stable under normal conditions.

Hazardous Combustion Products
Will produce carbon oxides.

Special Fire Fighting Procedures
As for surrounding fire.

Flammable Limits in air, % by vol. Non-Flammable:

Upper	Lower	Flash Point (Test Method)
N/A	N/A	**Non flammable**

HEALTH HAZARD INFORMATION FOR PRODUCT

Emergency and First Aid Procedures

Inhalation: If symptoms are experienced, remove source of contamination or move victim to fresh air.

Ingestion: If ingestion of a large amount does occur, seek medical attention.

Eyes: Immediately flush eyes with water for at least 15 minutes while holding eyelids open. If irritation persists get medical attention.

Skin: Rinse with water.

EFFECTS OF OVEREXPOSURE (ACUTE AND CHRONIC)

Inhalation : Inhalation of vapors or mists of the product may be irritating to the respiratory system.

Ingestion : Ingestion of large amounts may produce gastrointestinal disturbances including irritation, nausea, and diarrhea.

Eyes : This product may cause irritation of the eyes.

Skin : No adverse effects expected by prolonged contact.

PREVENTIVE MEASURES

Spillage Isolate spill or leak area immediately. For small spills, wash area with water.

Waste Dip.Method Dispose in accordance with federal, provincial and local regulations in designated landfill sites.

Hnd. & Stor. Requir. Avoid contact with eyes. Avoid breathing vapors or mists of this product. Use good personal hygiene practices. Store in a dry, well-ventilated area.

Ventilation General ventilation is sufficien.t

Resp. Protection Not normally necessary.

Eye Protection Not normally necessary.

Other Protection Not normally necessary.

Agrium Material Safety Data Sheet

NFPA Classification	DOT / TDG Pictograms	WHMIS Classification	PROTECTIVE CLOTHING
Health 3, Flammability 1, Reactivity 0, Specific Hazard ALK			

Section I. Chemical Product and Company Identification

PRODUCT NAME/ TRADE NAME	**Anhydrous Ammonia, Agricultural Grade, 82-0-0**

SYNONYM	This Material Safety Data Sheet applies to the following Agrium products: Anhydrous Ammonia, Agricultural Grade 82-0-0 Borger Production Anhydrous Ammonia, Agricultural Grade 82-0-0 Carseland Production Anhydrous Ammonia, Agricultural Grade 82-0-0 Fort Saskatchewan Production Anhydrous Ammonia, Agricultural Grade 82-0-0 Joffre Production Anhydrous Ammonia, Agricultural Grade 82-0-0 Kenai Production Anhydrous Ammonia, Agricultural Grade 82-0-0 Redwater Production Synonyms: 82-0-0 Anhydrous Ammonia Liquified ammonia Ammonia, Anhydrous, Standard Grade	**MSDS NUMBER:**	09201
CHEMICAL NAME	Ammonia	**REVISION NUMBER**	5.6
CHEMICAL FAMILY	Alkali	**MSDS prepared by the Environment, Health and Safety Department on:**	March 15, 2003
CHEMICAL FORMULA	NH_3	**24 HR EMERGENCY TELEPHONE NUMBER:**	
MATERIAL USES	Agricultural industry: Fertilizer. Industrial applications: Manufacture of chemicals, synthetic fibers, cleaning solutions, and specialty fertilizers.	**Transportation: 1-800-792-8311** **Medical: 1-888-670-8123**	

MANUFACTURER	SUPPLIER
Agrium North American Wholesale 13131 Lake Fraser Drive, S.E. Calgary, Alberta, Canada, T2J 7E8 Agrium U.S. Inc. Suite 1700, 4582 South Ulster St. Denver, Colorado, U.S.A., 80237	Agrium North American Wholesale 13131 Lake Fraser Drive, S.E. Calgary, Alberta, Canada, T2J 7E8 Agrium U.S. Inc. Suite 1700, 4582 South Ulster St. Denver, Colorado, U.S.A., 80237

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Section II. Hazardous Ingredients

		Exposure Limits (ACGIH)						
NAME	CAS #	TLV-TWA mg/m³	TLV-TWA ppm	STEL mg/m³	STEL ppm	CEIL mg/m³	CEIL ppm	% by Weight
Ammonia anhydrous	7664-41-7	17	25	24	35			99.8
Water	7732-18-5							0.2

TOXICOLOGICAL DATA ON INGREDIENTS

Anhydrous Ammonia 82-0-0:

TFI Product Testing Program Results:
GAS LC_{50} Acute: 4,230-19,960 ppm Rat, Mouse 1 hour.
Subacute and chronic exposure, human: >100 ppm nasal and pulmonary irritation
100-200 ppm - moderate to severe eye irritation
200-1,000 ppm - eye damage
Ecotoxicity: Acute fish toxicity, LC_{50}, 96 hr, various species, 0.09-3.51 mg un-ionized ammonia/L; Acute aquatic invertibrate toxicity, Daphnia magna, 48 hr ASTM E-729-80 protocol, LC_{50}, 2.94 mg un-ionized ammonia N/L
Chronic fish toxicity, various species, 12d-5yr, NOEC: 0.025-1.2mg un-ionized ammonia/L; Chronic aquatic invertibrate toxicity, Daphnia magna and others, 21d-76wk NOEC: 0.163-0.42 mg un-ionized ammonia/L
Acute toxicity to terrestrial plants, various species, 4 min-16hrs, foliar injury: LOEC 3-250 ppm, species dependent.

Section III. Hazards Identification.

POTENTIAL ACUTE HEALTH EFFECTS

Anhydrous ammonia gas or liquid is very corrosive to body tissues, reacting with body moisture on contact.

The odour recognition threshold for ammonia is on average 17 PPM although the range of sensitivity ranges from 0.7 PPM for persons with an acute sense of smell to 50 PPM for acclimatized individuals. Generally, concentrations of up to 25 PPM are tolerated although unpleasant and pungent. Above this concentration, irritation of the eyes, nose and throat may begin. The extent of irritation increases with increasing ammonia concentration.

Eye and throat irritation is more pronounced between 100 and 400 PPM. Above 400 PPM, skin irritation is noticable and immediate throat irritation and coughing will result. NIOSH has established 300 PPM as the concentration immediately dangerous to life and health (IDLH), which is defined as the concentration above which self-rescue may be difficult or impossible due to physiological effects. At concentrations between 1000 PPM and 2500 PPM increasing chest tightness, brochospasm and severe eye and skin irritation will result. Delayed effects such as chemical pneumonitis and pulmonary edema may develop several hours after exposure. At concentrations above 2500 PPM, laryngeal spasm may occur resulting in rapid asphyxia. Effects may be more pronounced at lower concentrations in children, the elderly, and persons with impaired lung function.

Eyes:
Eye irritant. May cause severe eye irritation with corneal injury and permanent vision impairment.

Skin:
Skin irritant. Contact may cause severe skin irritation, chemical burns, and blistering. Contact with vaporizing liquid may cause frosbite due to rapid evaporative cooling. Cooling effect may mask the extent of corrosive injury received.

Inhalation:
Irritating to entire respiratory tract. Excessive overexposure may cause severe irritation to the upper respiratory tract and potential lung damage.

Ingestion:
Ingestion is not a likely route of exposure due to the physical state of the substance (a compressed, liquified gas).

POTENTIAL CHRONIC HEALTH EFFECTS

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CARCINOGENIC EFFECTS: NONE by ACGIH, EPA, IARC, OSHA.
MUTAGENIC EFFECTS: NONE by ACGIH, EPA, IARC, OSHA.
TERATOGENIC EFFECTS: NONE by ACGIH, EPA, IARC, OSHA.
The substance is harmful to the eyes, lungs and mucous membranes. Repeated or prolonged exposure to the substance can produce target organ damage. Sub-acute and chronic exposures to concentrations of 100-200 ppm may result in eye irritation while concentrations of 200-1000 ppm may produce eye damage.

Section IV. First Aid Measures

EYE CONTACT	IMMEDIATELY FLUSH EYES WITH WATER for at least 30 minutes, keeping eyelids open. OBTAIN MEDICAL ATTENTION IMMEDIATELY.
MINOR SKIN CONTACT	Flush skin with large amounts of water for at least 30 minutes while removing contaminated clothing and shoes. Obtain immediate medical attention.
EXTENSIVE SKIN CONTACT	No additional information.
MINOR INHALATION	Loosen tight clothing. Allow to rest in a well ventilated area. Give artificial respiration if breathing has stopped. Obtain immediate medical attention.
SEVERE INHALATION	If gases or vapors are present, rescuers must wear self-contained breathing apparatus and an impervious (Level A) encapsulating suit if subject to US OSHA requirements. (29CFR 1910.120 has been deemed to overrule the lesser protection requirements given in 1910.111) In other jurisdictions or if responding under D.O.T. rules (49CFR) full bunker gear or Level B clothing may suffice. Evacuate affected persons to a safe area as soon as possible. Loosen tight clothing around the neck and waist. If the person is not breathing, perform artificial respiration. If breathing is difficult, administer oxygen. Maintain an open airway. Obtain immediate medical attention. Observation may be warranted. Pulmonary edema may occur several hours after exposure.
SLIGHT INGESTION	If anhydrous ammonia has entered the mouth or throat, begin resuscitation or artificial respiration and continue until victim is breathing. Administer oxygen if available. Obtain immediate medical attention. Do not induce vomiting. Careful removal of the substance from the stomach by medical personnel is required. Call a physician or poison control center immediately. Get immediate medical attention. If tolerated, give no more than 1 cup of milk or water to rinse the mouth and throat and dilute the stomach contents. No more than 8 ounces (1 cup) in adults and 4 ounces (1/2 cup) in children is recommended to minimize the risk of vomiting.
EXTENSIVE INGESTION	No additional information.

Section V. Fire and Explosion Data

THE PRODUCT IS	Combustible. Product will burn with difficulty if kept between the LEL of 16% and UEL of 25%. This gas is generally regarded as non-flammable due to the difficulty of ignition.
AUTO-IGNITION TEMPERATURE	651.1°C (1204°F)
FLASH POINT	Not applicable. Material exists as a gas unless confined under pressure.
FLAMMABILITY LIMITS	LOWER: 16% UPPER: 25%
PRODUCTS OF COMBUSTION	Nitrogen oxides (NO, NO_2 ...).
FIRE HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES	May ignite in the presence of open flames and sparks. Narrow lower to upper flammability limits (16-25%) makes ignition difficult but not impossible.
EXPLOSION HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES	Slightly explosive in the presence of reducing materials (hypochlorites or other halogenated compounds). Non-explosive in the presence of open flames and sparks, shocks, heat, oxidizing materials, combustible materials, organic materials, metals, acids, alkalis, or moisture unless with the very narrow flammablility range.

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FIRE FIGHTING MEDIA AND INSTRUCTIONS	Corrosive. If gases or vapours are present, rescuers must wear self-contained breathing apparatus and an impervious (Level A) encapsulating suit if subject to US OSHA requirements. (29CFR 1910.120 has been deemed to overrule the lesser protection requirements given in 1910.111) In other jurisdictions or if responding under D.O.T. rules (49CFR) full bunker gear or Level B clothing may suffice. Approach from upwind. If anhydrous ammonia catches fire, stop flow of gas or liquid if it may be done safely. Cool containing vessels with water in order to prevent pressure build-up, autoignition or explosion. Move containing vessels from fire if without risk. Use water fog to suppress vapors. Do not direct water into spilled ammonia. Ammonia is a cryogenic liquid which will cool with evaporation thereby limiting vapour release. Fire water at supply temperature will increase liquid ammonia's temperature resulting in greater evaporation. Contain run-off water for treatment.
SPECIAL REMARKS ON FIRE HAZARDS	When heated to decomposition it emits toxic fumes. Hazardous Combustion Products: Nitrogen oxides
SPECIAL REMARKS ON EXPLOSION HAZARDS	Explosive when mixed with chlorinated materials such as hypochlorites. Forms nitrogen trichloride which explodes spontaneously in air. Reacts similarly with other halogenated materials.

Section VI. Accidental Release Measures

SMALL SPILL	Warn personnel to move away. Keep unprotected personnel upwind of spill area. DO NOT APPROACH LIQUID OR VAPOR CLOUD WITHOUT ENCAPSULATING SUIT AND SCBA. If possible to do so without hazard, isolate leak by shutting off supply of ammonia from containing vessel. Use water fog to suppress airborne vapors from leak or spill. DO NOT DIRECT WATER INTO SPILLED LIQUID! ANHYDROUS AMMONIA WILL AUTOREFRIGERATE REDUCING VAPOR RELEASE. ADDITION OF WATER WILL WARM CRYOGENIC LIQUID RESULTING IN GREATER GASIFICATION. Contain run-off water for later recovery and treatment. Call emergency number on this MSDS sheet for assistance.
LARGE SPILL	Corrosive gas. Material will autorefrigerate under accidental release presenting a cold dense heavier than air vapor cloud or fog. Warn personnel to move away. Keep unprotected personnel upwind of spill area. Evacuate any unprotected personnel who are downwind of spills. Consider an exclusion zone of 1500 metres or 5000 feet around the incident area. Incident Commander may adjust size of exclusion zone based on the circumstances of the emergency and analysis of the threat presented by the release. See Exposure Limits Section for Evacuation Guidelines. Community Emergency Response Instructions: * Stay indoors (unless evacuation has been called) * Close all windows and doors * Shut off furnace, exhaust fans, and air conditioners * Wait for and follow advice from local police or authorities * If smell is very strong, breath through a wet cloth Eliminate all sources of ignition. DO NOT APPROACH LIQUID OR VAPOR CLOUD WITHOUT ENCAPSULATING SUIT AND SCBA. If possible, and personnel are protected by appropriate personal protective equipment, turn leaking container so that gas escapes rather than liquid, or isolate leak by shutting off supply of ammonia from containing vessel. If possible, apply patch or otherwise restrict size of leak. Use water fog to suppress airborne vapors from leak or spill. DO NOT DIRECT WATER INTO SPILLED LIQUID! ANHYDROUS AMMONIA WILL AUTOREFRIGERATE REDUCING VAPOR RELEASE. ADDITION OF WATER WILL WARM CRYOGENIC LIQUID RESULTING IN GREATER GASIFICATION. Contain run-off water for later recovery and treatment. Call Emergency Number on this MSDS sheet for assistance.

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Section VII. Handling and Storage

PRECAUTIONS	Keep ammonia handling facilities locked. Keep storage vessels away from direct heat. Ground all equipment. Keep away from incompatible materials such as oxidizing agents, reducing agents, metals, and acids. Keep children away from ammonia storage and handling equipment.
STORAGE	Keep away from combustible materials, heat, and incompatible materials, especially dry or liquid bleach. Ensure facilities are well maintained and emergency response and first aid equipment is readily available. Always ensure there is a nearby source of water for first aid purposes and spill response. Facilities storing or handling ammonia should be equipped with an eyewash and safety shower, or other equipment for emergency decontamination. See requirements under 29 CFR 1910.111.

Section VIII. Exposure Controls/Personal Protection

ENGINEERING CONTROLS	Workers must be trained in the safe handling and use of ammonia. Adequate, well engineered systems must be provided for storage, transfer and use. Process block valves, equipment enclosures and other isolation facilities may be necessary. Provide adequate general or local exhaust systems to maintain concentrations within exposure guidelines.
PERSONAL PROTECTION	The selection of personal protective equipment varies, depending upon conditions of use. Respiratory Protection: Use a NIOSH approved chemical cartridge respirator with full facepiece for ammonia concentrations up to 300 PPM. Use a positive pressure (pressure demand) SCBA for concentrations above 300 PPM, for emergency response, or for entry into unknown concentrations. Eye Protection: Contact lenses should not be worn when handling anhydrous ammonia. Use chemical goggles and a face shield or full facepiece air purifying or air supplied respirator. Skin Protection: Where chemical contact is unlikely, wear butyl rubber, nitrile, or polyvinyl chloride boots, gloves, rain jacket and pants.
PERSONAL PROTECTION IN CASE OF LARGE RELEASE	Under emergency conditions, where contact with liquid anhydrous ammonia or high concentration gas is probable, chemically resistant, gastight totally encapsulating suits with 60 minute positive pressure SCBA are required. For U.S. work sites where respiratory protection is required, ensure that a respiratory protection meeting 29 CFR 1910.134 is in place.
EXPOSURE LIMITS	Consult local authorities for acceptable exposure limits in your jurisdiction. ACGIH TLV-TWA: 25 ppm, TLV-STEL: 35 ppm. MSHA STANDARD-air:TWA 25 ppm (18 mg/m^3) U.S. OSHA: OSHA PEL (Gen Industry):8Hr TWA 50 ppm (35 mg/m^3) REFERENCE: Code of Federal Regulations 29:1910.1000 OSHA PEL (Construction):8Hr TWA 50 ppm (35 mg/m^3) REFERENCE: Code of Federal Regulations 29:1926.55 OSHA PEL (Shipyard):8Hr TWA 50 ppm (35 mg/m^3) REFERENCE: Code of Federal Regulations 29:1915.1000 NIOSH REL, AMMONIA in air:10Hr TWA 25 ppm; STEL 35 ppm; IDLH 300 ppm AIHA Emergency Response Planning Guidelines: * ERPG-1: <25 PPM for 1 hour. Objectionable odor. * ERPG-2: 25-150 PPM for 1 hour. Strong objectionable odor, some eye, nose and throat irritation. * ERPG-3: 150-750 PPM for 1 hour. Severe eye and respiratory irritation, without development of life threatening health effects.

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Section IX. Physical and Chemical Properties

PHYSICAL STATE AND APPEARANCE	Colorless cryogenic liquid or gas.		
MOLECULAR WEIGHT	17.03	**COLOR**	Colorless.
pH (10% SOLN/WATER)	12	**ODOR**	Ammoniacal. (Strong.)
BOILING POINT	-33.35°C (-28°F)	**ODOR THRESHOLD**	17 ppm (recognition)
MELTING POINT	-77.7°C (-107.9°F)	**TASTE**	Burning. (Strong.)
CRITICAL TEMPERATURE	Not available.	**VOLATILITY**	100% (w/w).
SPECIFIC GRAVITY g/cc	0.62 (Water = 1)	**SOLUBILITY**	Easily soluble in cold or hot water.
BULK DENSITY kg/m³ ; lbs/ft³	620 kg/m³; 5.04 lbs/gal (US)	**DISPERSION PROPERTIES**	See solubility in water, methanol.
VAPOR PRESSURE	125 psi at 68°F (20°C)	**WATER/OIL DIST. COEFF.**	The product is more soluble in water.
VAPOR DENSITY	0.6 (Air = 1)		

Section X. Stability and Reactivity Data

STABILITY	The product is stable.
INSTABILITY TEMPERATURE	Not available.
CONDITIONS OF INSTABILITY	No additional information.-
INCOMPATABILITY WITH VARIOUS SUBSTANCES	Extremely reactive or incompatible with acids. Highly reactive with oxidizing agents and reducing agents. Do not use copper, brass, bronze, or galvanized steel in contact with ammonia. Do not use brazed joints in ammonia service. Forms explosive compounds with many heavy metals such as mercury or silver. Reacts explosively with chlorine, hypochlorites (such as bleach or dry chlorinating chemicals) and other halogens (bromine, iodine, fluorine).
CORROSIVITY	Highly corrosive to copper and its alloys. Slightly corrosive to aluminum and zinc. Very slightly corrosive to mild steel. Non-corrosive to glass or stainless steel (304 or 316).
SPECIAL REMARKS ON REACTIVITY	Incompatible with halogens, aluminum, copper, brass, and zinc. Incompatible with strong acids.
SPECIAL REMARKS ON CORROSIVITY	Corrosive to brass. Incompatible with copper alloys (stress cracking). Will corrode a wide variety of metals. Contact your sales representative or a metallurgical specialist to ensure compatability with system equipment.

Section XI. Toxicological Information

SIGNIFICANT ROUTES OF EXPOSURE	Inhalation. Eye contact. Skin contact.
TOXICITY TO ANIMALS	See Section II.
SPECIAL REMARKS ON TOXICITY TO ANIMALS	Hazardous for humans or animal life. Corrosive to skin and eyes on contact. Severe over-exposure can produce lung damage, choking, unconsciousness or death. May cause severe eye irritation.
OTHER EFFECTS ON HUMANS	Slightly to very dangerous in case of skin contact, eye contact, or inhalation. Material may be irritating or corrosive.
SPECIAL REMARKS ON CHRONIC EFFECTS ON HUMANS	Exposure can cause coughing, chest pains, difficulty in breathing. Repeated significant overexposure can cause permanent lung function damage, edema and chemical pneumonitis. May cause serious damage to the eyes.

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SPECIAL REMARKS ON OTHER EFFECTS ON HUMANS	No additional remark.

Section XII. Ecological Information

ECOTOXICITY	Hazardous for humans or animal life. Ammonia is a toxic hazard to fish. In low concentrations in water and soil, ammonia acts as a fertilizer to promote plant growth. Under aerobic conditions ammonia will oxidize to nitrate and does not accumulate in the environment. Sub-lethal concentrations in water can have adverse physiological effects on marine species. Free ammonia concentrations of 2.5 mg per litre at pH 7.4 to 8.5 are considered harmful to marine life. In water, free NH_3 is considered to be the primary toxic form while the much more prevalent NH_4OH form is much less harmful.
BOD and COD	Not available.
PRODUCTS OF DEGRADATION	Nitrogen oxides (NO,NO_2 ...), nitrates.
TOXICITY OF THE PRODUCTS OF DEGRADATION	The products of degradation are less toxic than the original product.
SPECIAL REMARKS ON THE PRODUCTS OF DEGRADATION	Product may degrade water quality and taste. Notify downstream water users. Will dissolve and disperse in water.

Section XIII. Disposal Considerations

WASTE DISPOSAL OR RECYCLING	Call for assistance on treatment and disposal.

Section XIV. Transport Information

DOT / TDG CLASSIFICATION

Canada:
TDG (Clear Language Regulations) Class 2.2: Non-flammable compressed gas. Subsidiary Class 8 Corrosive.

U.S.
DOT Classification under §172.101 for shipments originating in the United States for U.S. domestic destinations:
DOT Class 2.2: Non-flammable compressed gas.

Shipping documents must have the words "Inhalation Hazard" entered in association with the shipping description, and each bulk package shall have the words "Inhalation Hazard" marked on two opposites sides of the package. Size of the markings must conform to the requirements of §172.302(b).

DOT Classification for Canadian origin shipments and packagings under §171.12a:
(a) Scope and applicability. This section sets forth provisions for the transportation by rail or highway of shipments of hazardous materials which conform to the regulations of the Government of Canada but which may differ from the requirements of this subchapter with regard to hazard communication, classification or packaging. Except as provided in paragraph (b)(5)(iv) of this section, the provisions apply only to shipments which originate in Canada and either terminate in the U.S. or transit the U.S to a Canadian or foreign destination, and to the return to Canada of empty bulk packages containing residues of hazardous materials which originally were imported into the U.S. Reciprocal provisions, applicable to exports from the U.S., appear in the regulations of the Government of Canada.
(b) Conditions and limitations. Notwithstanding the requirements of parts 172, 173, and 178 of this subchapter, and subject to the limitations of paragraph (a) of this section, a hazardous material that is classed, marked, labeled, placarded, described on a shipping paper, and packaged in accordance with the Transportation of Dangerous Goods (TDG) Regulations issued by the Government of Canada may be offered for transportation and transported to or through the United States by motor vehicle or rail car. Copies of the TDG Regulations may be obtained from the Canadian Government Publishing Centre, Ottawa, Ontario K1A 059; Telephone (819) 956-4800. The following conditions and limitations apply:
(b)(5)(iii) ... For shipments of anhydrous ammonia, the shipping paper must contain an

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	indication that the markings, labels and placards have been applied in conformance with the TDG Regulations and this paragraph (b)(5).
PIN and Shipping Name	Proper shipping name: Ammonia, anhydrous PIN: UN1005
SPECIAL PROVISIONS FOR TRANSPORT	49 CFR 172.102: 13, T50
DOT (U.S.A) (Pictograms)	

Section XV. Other Regulatory Information and Pictograms

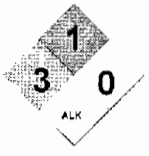
OTHER REGULATIONS

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
TSCA (Toxic Substance Control Act): This product is listed on the TSCA Inventory.
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL), and acceptable for use under the provisions of CEPA.
CERCLA: If the reportable quantity of this product is accidentally spilled, the incident is subject to the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and must be reported to the National Response Centre by calling (800) 424-8802. The reportable spill quantity of this product is 100 lbs.
SARA HAZARD CATEGORY: This product has been revised according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:
Immediate Health, Delayed Health, Fire, Sudden Release of Pressure, Reactive
This product contains the following Section 313 reportable ingredient:
Ammonia Cas # 7664-41-7 Maximum %: 100.0
Subject to the provisions of 40 CFR Part 68 Subpart G - Risk Management Plan if stored in quanties in excess of 10,000 lbs.
CALIFORNIA PROPOSITION 65: The following statement is made in order to comply with the California Safe Drinking Water and Toxic Enforcement Act of 1986 (CA Health and Safety Code Sec 25249.5):
This product contains no chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

OTHER CLASSIFICATIONS	**HCS (U.S.A.)**	HCS CLASS: Toxic.
	DSCL (EEC)	R10- Flammable. R23- Toxic by inhalation.

National Fire Protection Association (U.S.A.)

Hazards presented under acute emergency conditions only:



Health

Fire Hazard

Reactivity

Specific Hazard

TDG (Pictograms - Canada)

DSCL (Europe) (Pictograms)

ADR (Europe) (Pictograms)

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Section XVI. Other Information

REFERENCES

-Transportation of Dangerous Goods Act and Clear Language Regulations.
-Canada Gazette Part II, Vol. 122, No. 2 Registration SOR/88-64 31 December, 1987 Hazardous Products Act "Ingredient Disclosure List".
-Domestic Substances List, Canadian Environmental Protection Act.
-Canadian Centre for Occupational Health and Safety Infodisk Series
-29 CFR Part 1910
-33 CFR Parts 151, 153, 154, 156
-40 CFR Parts 1-799
-46 CFR Part 153
-49 CFR Parts 1-199
-American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances, 2002.
-Fire Protection Guide to Hazardous Materials, (NFPA49, 325M, 491M, and 704), National Fire Protection Association, 10th Ed, 1991
-Corrosion Data Survey, Sixth Edition, 1985, National Association of Corrosion Engineers
-TOMES® System: Heitland G & Hurlbut KM (Eds) (electronic version): MICROMEDEX, Greenwood Village, Colorado, USA. Available at: http://csi.micromedex.com (2002). The TOMES® System includes MEDITEXT® Medical Management; HAZARDTEXT® Hazard Management; INFOTEXT® Documents; ERG2000 Emergency Response Guidebook Documents; REPROTEXT®: Heitland G & Hurlbut KM (Eds); CHRIS Hazardous Chemical Data: U.S. Department of Transportation, U.S. Coast Guard, Washington, D.C. (2002); HSDB: Hazardous Substances Data Bank. National Library of Medicine, Bethesda, Maryland (2002); IRIS: Integrated Risk Information System. U.S. Environmental Protection Agency, Washington, D.C. (2002); NIOSH: Pocket Guide to Chemical Hazards. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2002); OHM/TADS: Oil and Hazardous Materials Technical Assistance Data System. U.S. Environmental Protection Agency, Washington, D.C. (2002); REPROTOX®: Scialli A.R. Georgetown University Medical Center and Reproductive Toxicology Center, Columbia Hospital for Women Medical Center, Washington, D.C. (2002); RTECS®: Registry of Toxic Effects of Chemical Substances. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2002); and SHEPARDS: Shepard T.H.: Shepard's Catalog of Teratogenic Agents (2002).
-The Fertilizer Institute Product Testing Program Results, March 2003

OTHER SPECIAL CONSIDERATIONS

No additional information.

FOR FURTHER SAFETY, HEALTH, OR ENVIRONMENTAL INFORMATION ON THIS PRODUCT, CONTACT

AGRIUM
Environment, Health and Safety Department
Telephone (403) 225-7380 or Fax (403) 225-7608

Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name:	Argon	**Trade Name:**	Argon
Product Use:	Metal industry: Welding and cutting of metals.		
Chemical Name:	Argon	**Synonym:**	Shielding Gas, Argon 40
Chemical Formula:	Ar	**Chemical Family:**	(Rare Gas) Noble Gas
Telephone:	**Emergencies:** * 1-800-363-0042	**Supplier /Manufacture:**	Praxair Canada Inc. 1 City Centre Drive Suite 1200 Mississauga, ON L5B 1M2
		Phone:	905-803-1600
		Fax:	905-803-1682

**Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier or Praxair sales representative.*

2. Composition and Information on Ingredients

INGREDIENTS	% (VOL)	CAS NUMBER	LD_{50} (Species & Routes)	LC_{50} (Rat, 4 hrs.)	TLV-TWA (ACGIH)
Argon	100	7440-37-1	Not applicable.	Not available.	Simple asphyxiant.

3. Hazards Identification

Emergency Overview

CAUTION! High-pressure gas. Can cause rapid suffocation. May cause dizziness and drowsiness. Self-contained breathing apparatus may be required by rescue workers.

ROUTES OF EXPOSURE: Inhalation.

THRESHOLD LIMIT VALUE: TLV-TWA Data from 2004 Guide to Occupational Exposure Values (ACGIH). TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION: Asphyxiant. Effects are due to lack of oxygen. Moderate concentrations may cause headaches, drowsiness, dizziness, excitation, excess salivation, vomiting, and unconciousness. Lack of oxygen can kill.

SKIN CONTACT: No harm expected.

SKIN ABSORPTION: No harm expected.

SWALLOWING: This product is a gas at normal temperature and pressure.

EYE CONTACT:

No harm expected.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE:

A knowledge of the available toxicology information and of the physical and chemical properties of the material suggests that overexposure is unlikely to aggravate existing medical conditions.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, or 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 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 known.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:

Repeated or prolonged exposure is not known to aggravate medical condition.

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

None currently known.

CARCINOGENICITY:

Not listed as carcinogen by OSHA, NTP or IARC.

4. First Aid Measures

INHALATION:

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

SKIN CONTACT:

Flush with water.

SWALLOWING:

This product is a gas at normal temperature and pressure.

EYE CONTACT:

Flush with water.

NOTES TO PHYSICIAN:

This product is inert. There is no specific antidote. Treatment of over-exposure should be directed at the control of symptoms and the clinical condition.

5. Fire Fighting Measures

FLAMMABLE :	No.	IF YES, UNDER WHAT CONDITIONS?	Not applicable.
FLASH POINT (test method)	Not applicable.	AUTOIGNITION TEMPERATURE	Not applicable.
FLAMMABLE LIMITS IN AIR, % by volume:	LOWER: Not applicable.	UPPER:	Not applicable.

EXTINGUISHING MEDIA:

This material cannot catch fire. Use media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:

CAUTION! **High-pressure gas.** Asphxiant. Effects are due to lack of oxygen. Evacuate all personnel from danger area. Immediately deluge cylinders with water from maximum distance until cool; then move them away from fire area if without risk. Shutoff leak if without risk. Arcs and sparks can ignite combustion. Self-contained breathing apparatus may be required by rescue workers. Refer to American National Standard Z49.1 "Safety in Welding and Cutting" for fire prevention information during the use of welding and allies procedures.

UNUSUAL FIRE AND EXPLOSION HAZARD:

Heat of fire can build pressure in cylinder and cause it to rupture. No part of cylinder should be subjected to a temperature higher than 52 C. Cylinders containing this mixture are equipped with a pressure relief device. (Exceptions may exist where authorized by TDG Regulations.).

HAZARDOUS COMBUSTION PRODUCTS:

None.

SENSITIVITY TO IMPACT:

Avoid impact against container.

SENSITIVITY TO STATIC DISCHARGE:

Not applicable.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

CAUTION! **High-pressure gas.** Evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Shut off flow if you can do so without risk. Ventilate area or move cylinder to a well-ventilated area. Test for sufficient oxygen, especially in confined spaces, before allowing reentry.

WASTE DISPOSAL METHOD:

Slowly release into atmosphere. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, provincial, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN STORAGE:

Store and use with adequate ventilation. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 52 C. Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

PRECAUTIONS TO BE TAKEN IN HANDLING: