

Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name: Monoethylamine	Trade Name: Monoethylamine
Product Use: Many.	
Chemical Name: Ethylamine	Synonym: Aminoethane, Ethanamine, MEA
Chemical Formula: C ₂ H ₅ NH ₂	Chemical Family: Amine
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)
Ethylamine	100	75-04-7	Not applicable.	8000 ppm	5 ppm

3. Hazards Identification

Emergency Overview

DANGER! Flammable, corrosive liquid and gas under pressure. Can form explosive mixture with air. Can cause eye, skin, and respiratory tract burns. May cause lung, liver, kidney, and heart damage. Harmful if inhaled or absorbed through the skin. Self-contained breathing apparatus must be worn by rescue workers.

ROUTES OF EXPOSURE: Absorbed through skin. Eye contact. Inhalation. Ingestion.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION: Overexposure above the Threshold Limit Value (TLV) of 10 ppm (OSHA) may cause irritation to the respiratory tract, experienced as sneezing, coughing, burning sensation of throat with constricting sensation of the larynx, and difficulty in breathing. High concentrations may cause damage to the liver, kidney, and heart, and cause tracheitis, bronchitis, pneumonia, and pulmonary edema.

SKIN CONTACT: Vapour may cause skin irritation experienced as itching and with local redness. Exposure to liquid may cause severe local redness with swelling, and chemical burns with necrosis of the skin could occur.

SKIN ABSORPTION: Prolonged or widespread skin contact with the liquid may result in the absorption of harmful amounts of material.

SWALLOWING: May cause chemical burns of the mouth throat, and esophagus. Signs and symptoms will include pain or discomfort in the mouth, throat, chest and abdomen, nausea, diarrhea, vomiting, dizziness, weakness, collapse, and coma.

EYE CONTACT: Liquid may produce severe irritation seen as excess redness and swelling of the conjunctiva with chemical burns of the cornea. Vapour may cause temporary disturbance of vision.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE:

Chronic exposure may cause low grade dermatitis and conjunctivitis, due to the material's irritating effects.

OTHER EFFECTS OF OVEREXPOSURE:

May cause sensitization and the development of allergic contact dermatitis.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:

Inhalation may aggravate asthma and inflammatory or fibrotic pulmonary disease. Because of its irritating properties, this material may aggravate an existing dermatitis.

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. Keep patient warm.

SKIN CONTACT:

Immediately flush affected areas with water for at least 15 minutes while removing contaminated clothing and shoes. Discard clothing and shoes. Call a physician.

SWALLOWING:

This product is a gas at normal temperature and pressure. Rinse mouth with water. Give at least two glasses of water or milk at once. Do not induce vomiting. Call a physician.

EYE CONTACT:

For contact with the liquid, immediately flush eyes thoroughly with warm water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. See a physician, preferably an ophthalmologist, immediately.

NOTES TO PHYSICIAN:

Victims of overexposure by inhalation should be observed for up to 72 hours for delayed onset of pulmonary edema. Use of acidics to neutralize swallowed contents is contraindicated. Exposure to the vapour may cause minor transient edema of the corneal epithelium. This condition, referred to as "glauropsia", or "blue haze" or "blue-gray haze", produces a blurring of vision against a general bluish haze and the appearance of halos around bright objects. The effect disappears spontaneously within a few hours of the end of an exposure, and leave no sequelae. Although not detrimental to the eye per se, glauropsia predisposes and affected individual to physical accidents and reduces the ability to undertake skilled tasks such as driving a motorized vehicle. The hazards of this material are mainly due to its severe irritant and corrosive properties on the skin and mucosal surfaces. Careful gastric lavage is required. 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 : Yes.	IF YES, UNDER WHAT CONDITIONS?	Forms explosive mixtures with air and oxidizing agents.
FLASH POINT (test method)	OPEN CUP: -18°C (-0.4°F) (Tag.).	AUTOIGNITION TEMPERATURE 385°C (725°F)
FLAMMABLE LIMITS IN AIR, % by volume:	LOWER: 3.4	UPPER: 14.8

EXTINGUISHING MEDIA:

CO₂, dry chemical, water spray or fog.

SPECIAL FIRE FIGHTING PROCEDURES:

DANGER! Evacuate all personnel from danger area. Do not approach area without self-contained breathing apparatus and protective clothing. 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; therefore, appropriate measures should be taken; e.g., total evacuation. Re-approach with extreme caution. Reduce corrosive vapours with water spray or fog. Reverse flow into cylinder may cause rupture. Stop flow of gas if without risk while continuing water spray. Remove all containers from area if without risk. Allow fire to burn out.

UNUSUAL FIRE AND EXPLOSION HAZARD:

Toxic, flammable, corrosive 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 and toxic vapours from this product 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. 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. The cylinders are not equipped with pressure relief devices to release pressure. Evacuate the area if the fire cannot be brought under immediate control to protect persons from cylinder rupture and toxic fumes.

HAZARDOUS COMBUSTION PRODUCTS:

These products are carbon oxides (CO, CO₂), nitrogen oxides (NO, NO₂...).

SENSITIVITY TO IMPACT:

Avoid impact against container.

SENSITIVITY TO STATIC DISCHARGE:

Possible.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

DANGER! DANGER: Forms explosive mixtures with air. Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus operated in the pressure demand mode and appropriate protective clothing. 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. Flammable, toxic, corrosive vapours may spread from spill. Before entering area, especially confined areas, check atmosphere with appropriate device.

WASTE DISPOSAL METHOD:

Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard and product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, 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 m or use a barricade of non-combustible material. This barricade should be at least 1.5 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. 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, see Section 16.

For additional information on storage and handling, refer to Compressed Gas Association (CGA) pamphlet P-1, *Safe Handling of Compressed Gases in Containers*, available from the CGA. Refer to Section 16 for the address and phone number along with a list of other available publications.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE:

Toxic, flammable, corrosive liquid and gas under pressure. May be fatal if inhaled. Do not breathe gas. Do not get liquid or vapours in eyes, on skin, or clothing. Safety showers and eyewash fountains should be immediately available. Use only in a closed system constructed of corrosion resistant materials. 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. Store and use with adequate ventilation at all times. 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: Explosion-proof, corrosion resistant, forced draft fume hood is preferred. See SPECIAL.

MECHANICAL (general): Inadequate.
See SPECIAL.

SPECIAL: Use only in a closed system.

OTHER: See SPECIAL.

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.

SKIN PROTECTION: Nitrile gloves.

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. (Compressed Gas.)	FREEZING POINT: -81°C (-113.8°F)	pH: Not applicable.
BOILING POINT: 16.6°C (61.9°F)	VAPOUR PRESSURE: Not available.	MOLECULAR WEIGHT: 45.09 g/mole
SPECIFIC GRAVITY: LIQUID (Water = 1): 0.684 @ 20 C	SOLUBILITY IN WATER: Complete.	
SPECIFIC GRAVITY: VAPOUR (air = 1): 1.56	EVAPORATION RATE (Butyl Acetate=1): >1 compared to (Butyl Acetate = 1)	COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable.
VAPOUR DENSITY: Not available.	% VOLATILES BY VOLUME: 100% (v/v).	ODOUR THRESHOLD: Not available.

APPEARANCE & ODOUR: Colourless. Odour: fishy to ammoniacal.

10. Stability and Reactivity

STABILITY:	The product is stable.
CONDITIONS OF CHEMICAL INSTABILITY:	Not available.
INCOMPATIBILITY (materials to avoid):	Copper, tin, zinc and their alloys, nickel, silver, acids and oxidizing agents.
HAZARDOUS DECOMPOSITION PRODUCTS:	Thermal decomposition or burning will produce highly toxic fumes of nitrogen oxides.
HAZARDOUS POLYMERIZATION:	Will not occur.
CONDITIONS OF REACTIVITY:	None known.

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: Ethylamine

HAZARD CLASS:	Class 2.1: Flammable gas.	IDENTIFICATION #: UN1036	PRODUCT REPORTABLE QUANTITY (PROQ): Any accidental release in a quantity that could pose a danger to public safety or any sustained release of 10 minutes or more
----------------------	------------------------------	--	---

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, non-ventilated compartment of a 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.

DSL (Canada) This product is on the DSL list

WHMIS (Canada) CLASS A: Compressed gas.
CLASS B-1: Flammable gas.
CLASS D-2B: Material causing other toxic effects (TOXIC).
CLASS E: Corrosive gas.

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 3
FLAMMABILITY 4

PHYSICAL HAZARD 2

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED:	CGA-705
PIN-INDEXED YOKE:	Not available.
ULTRA-HIGH-INTEGRITY CONNECTION:	Not available.

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
P-1	Safe Handling of Compressed Gases in Containers
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, Fifth Edition

PREPARATION INFORMATION:

DATE:	October 15, 2013
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 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.

Praxair and the *Flowing Airstream* design are trademarks of Praxair Canada Inc.

Other trademarks used herein are trademarks or registered trademarks of their respective owners.



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