Material Safety Data Sheet
Ethylenediamine

ACC# 96094

Section 1 - Chemical Product and Company Identification

MSDS Name: Ethylenediamine
Catalog Numbers: E479-4, E479-500, S80006
Synonyms: 1,2-Diaminoethane; 1,2-Ethanediamine; Dimethylenediamine; EDA.
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
107-15-3	Ethylenediamine	>98	203-468-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless viscous liquid. Flash Point: 34 deg C.
Danger! Causes eye and skin burns. Causes digestive and respiratory tract burns. **Flammable liquid and vapor.** May cause allergic respiratory and skin reaction. Harmful if absorbed through the skin. May be harmful if swallowed or inhaled. Hygroscopic (absorbs moisture from the air).
Target Organs: Kidneys, liver, lungs, eyes, skin, mucous membranes.

Potential Health Effects
Eye: Causes eye burns. Low vapor concentrations may cause a temporary visual disturbance known as 'blue haze' or 'halo vision'. Lachrymator (substance which increases the flow of tears).
Skin: Harmful if absorbed through the skin. Causes skin burns. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Undiluted EDA is corrosive to rabbit skin, causing complete tissue destruction after 6 to 12 minutes.
Ingestion: Causes gastrointestinal tract burns. May cause liver and kidney damage. May be harmful if swallowed.
Inhalation: May cause severe allergic respiratory reaction. Irritation may lead to chemical pneumonitis and pulmonary edema. May cause liver and kidney damage. Causes chemical burns to the respiratory tract. May cause asthma.
Chronic: May cause liver and kidney damage. Repeated exposure may cause allergic respiratory reaction (asthma).

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid immediately.
Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.
Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.
Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Flammable liquid and vapor. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.
Extinguishing Media: Solid streams of water may be ineffective and spread material. Use water spray, dry chemical, "alcohol resistant" foam, or carbon dioxide.
Flash Point: 34 deg C (93.20 deg F)
Autoignition Temperature: 385 deg C (725.00 deg F)
Explosion Limits, Lower:2.6 vol %
Upper: 14.2 vol %
NFPA Rating: (estimated) Health: 3; Flammability: 3; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. Evacuate unnecessary personnel. Approach spill from upwind. Use water spray to cool and disperse vapors, protect personnel, and dilute spills to form nonflammable mixtures.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Do not breathe vapor or mist. Use only with adequate ventilation or respiratory protection.

Storage: Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. Store protected from moisture. Store under nitrogen. Do not store in copper or copper alloy storage vessels.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ethylenediamine	10 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous r oute	10 ppm TWA; 25 mg/m3 TWA 1000 ppm IDLH	10 ppm TWA; 25 mg/m3 TWA

OSHA Vacated PELs: Ethylenediamine: 10 ppm TWA; 25 mg/m3 TWA

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Viscous liquid
Appearance: clear, colorless
Odor: ammonia-like
pH: 11.9 (25% aq soln)
Vapor Pressure: 12 mm Hg @ 25 deg C
Vapor Density: 2.07 (air=1)
Evaporation Rate:0.91 (butyl acetate=1)
Viscosity: 1.54 mPas 25 deg C
Boiling Point: 118 deg C @ 760 mmHg
Freezing/Melting Point:8.5 deg C
Decomposition Temperature:> 120 deg C
Solubility: Soluble.
Specific Gravity/Density:.8980 g/ml
Molecular Formula:C2H8N2
Molecular Weight:60.1

Section 10 - Stability and Reactivity

Chemical Stability: Absorbs carbon dioxide from air to form nonvolatile carbonate.
Conditions to Avoid: Ignition sources, moisture, excess heat, confined spaces.
Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, copper, copper

alloys.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, ammonia and/or derivatives.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 107-15-3: KH8575000
LD50/LC50:
CAS# 107-15-3:
Draize test, rabbit, eye: 750 ug Severe;
Draize test, rabbit, eye: 750 ug/24H Severe;
Inhalation, mouse: LC50 = 300 mg/m3;
Oral, mouse: LD50 = 1 gm/kg;
Oral, rat: LD50 = 1200 mg/kg;
Skin, rabbit: LD50 = 730 uL/kg;

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Skin, rabbit, LD50: 730 uL/kg = 649.7 mg/kg; Vapor concentrations of 4000 ppm for 8 hours killed 6/6 rats, while 2000 ppm produced no lethality (Doc of TLV).
Carcinogenicity:
CAS# 107-15-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Edema of the epithelium of the cornea, generally without pain, has been produced by amine vapors, causing colored haloes to be seen around lights, usually in the evening, after industrial exposure to the vapors of various amines.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: Most mutagenicity tests have produced negative results.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: LC50 = 115.7 mg/L; 96 Hr.; Static ConditionFish: Rainbow trout: LC50 = 230.0 mg/L; 96 Hr.; Static ConditionWater flea EC50 = 0.88 mg/L; 48 Hr.; UnspecifiedBacteria: Phytobacterium phosphoreum: EC50 = 20.0 mg/L; 15 Minutes; Microtox test Chub (fresh water) 60ppm/24H (lethal)Rainbow trout LC50=230 mg/L/48H
Environmental: On soil, substance will leach and volatilize. In water, substance will form alkaline solution and will biodegrade. Bioconcentration is not predicted. In air, substance will react with hydroxyl radicals and carbon dioxide. Biological Oxygen Demand (BOD): 75% (theor.), 5 days.
Physical: No information available.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to

ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ETHYLENEDIAMINE	ETHYLENEDIAMINE
Hazard Class:	8	8(6.1)
UN Number:	UN1604	UN1604
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 107-15-3 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
CAS# 107-15-3: 5000 lb final RQ; 2270 kg final RQ
SARA Section 302 Extremely Hazardous Substances
CAS# 107-15-3: 10000 lb TPQ
SARA Codes
CAS # 107-15-3: immediate, delayed, fire.
Section 313 No chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
CAS# 107-15-3 is listed as a Hazardous Substance under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 107-15-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

C

Risk Phrases:

R 10 Flammable.
R 21/22 Harmful in contact with skin and if swallowed.
R 34 Causes burns.
R 42/43 May cause sensitization by inhalation and skin contact.

Safety Phrases:

S 23 Do not inhale gas/fumes/vapour/spray.
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 36/37/39 Wear suitable protective clothing, gloves and eye/face pr otection.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 107-15-3: 2

Canada - DSL/NDSL

CAS# 107-15-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, D1B, E, D2A.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 107-15-3 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 5/10/1999
Revision #9 Date: 2/13/2008