# MATERIAL SAFETY DATA SHEET

# ETHYLENEDIAMINE (EDA)

## 1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION

**Chemical Name:** Ethylenediamine; EDA

**Manufacturer Information:**

Delamine B.V.
Barchman Wuytierslaan 10
3818 LH Amersfoort
PO Box 473
3800 AL Amersfoort, The Netherlands
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**FOR EMERGENCIES, CONTACT CHEMTREC 1-800-424-9300 OR 1-703-527-3887**

## 2. COMPOSITION/INGREDIENT DESCRIPTION

| Chemical Name | CAS # | OSHA Hazardous(Y/N) | Concentration (%) |
|---|---|---|---|
| Ethylenediamine | 107-15-3 | Y | 100 |

## 3. HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW:** FLAMMABLE LIQUID AND VAPOR. CORROSIVE TO EYES, SKIN, AND RESPIRATORY TRACT. HARMFUL IF SWALLOWED OR ABSORBED THROUGH SKIN. CHEMICALS OF THIS TYPE MAY CAUSE SENSITIZATION BY INHALATION OR SKIN CONTACT.

**Physical Appearance and Odor:** Clear liquid, ammonia-like odor

**POTENTIAL HEALTH EFFECTS:**

**Acute Eye:** Corrosive to eyes. May cause permanent damage and blindness. Vapors can cause a non-permanent vision problem of seeing “halos” or a “blue haze”.

**Acute Skin:** Corrosive. Chemicals of this type may cause sensitization upon prolonged or repeated exposure. Material may be absorbed through the skin.

**Acute Inhalation:** May cause severe irritation to respiratory tract, with coughing, nausea and sore throat. Chemicals of this type may cause sensitization upon prolonged or repeated exposure.

**Acute Ingestion:** Corrosive to gastrointestinal tract.

**Chronic Effects**: None known.

## 4. FIRST AID MEASURES

**Eye Contact:** Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. Seek immediate medical attention.

## 4. FIRST AID MEASURES (continued)

**Skin Exposure:** Remove contaminated clothing and shoes. Wash with plenty of soap and water, for at least 15 minutes. Seek immediate medical attention. Launder contaminated clothing and shoes before re-use.
**Inhalation:** If respiratory irritation or distress occurs, remove victim to fresh air. Seek medical attention if respiratory irritation or distress continues.
**Ingestion**: Do not induce vomiting. If victim is conscious and alert, give 1-2 glasses of water to drink. Do not give anything by mouth to an unconscious person. Seek immediate medical attention. Do not leave victim unattended.
**Medical Conditions Possibly Aggravated by Exposure:** Skin contact may aggravate existing skin disease.
**Notes to Physician:** All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred. Treat symptomatically. No specific antidote available.

## 5. FIRE FIGHTING MEASURES

**Flash point:** 104F (40C)
**Autoignition Temperature:** approx. 725F (385C)
**Flammability limits (vol/vol%):** Lower: 4.2% Upper: 14.4%
**Extinguishing Media:** water spray, fog, dry chemical, foam, $CO_2$
**Special Fire Fighting Procedures:** Firefighters should wear NIOSH/MSHA-approved self-contained breathing apparatus and full protective clothing. Cool containers exposed to fire with water.
**Unusual Fire and Explosion Hazards:** Closed containers may rupture due to buildup of pressure when exposed to extreme heat. Vapor may travel considerable distance to source of ignition and flash back.
**Hazardous Decomposition Materials Under Fire Conditions:** Oxides of carbon, oxides of nitrogen, ammonia

## 6. ACCIDENTAL RELEASE MEASURES

**Evacuation Procedures and Safety:** Wear appropriate protective gear for the situation. (See Personal Protection information in Section 8).
**Cleanup and Disposal of Spill**: Extinguish or remove all sources of ignition. Absorb with an inert absorbent. Sweep up, using non-sparking tools, and place in an appropriate closed container for disposal and/or incineration, avoiding contact with spilled material. Clean up residual material by washing area with water. Collect washings for disposal.
**Environmental and Regulatory Reporting:** Do not flush to drain. Spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

## 7. HANDLING AND STORAGE

**Maximum Storage Temperatures:** Store below 104F (40C)
**Handling:** Persons with a history of dermal or respiratory sensitization should not work with, or near, this material. Avoid breathing vapors. Avoid direct or prolonged contact with skin and eyes.

## 7. HANDLING AND STORAGE (continued)

**Storage:** Store in tightly-closed, original container. Store in an area that is cool, dry, dark and well-ventilated. Do not re-use container.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Introductory Remarks:** These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application.

**Exposure Guidelines:** The following limits apply to components of this material.

| Chemical | |
|---|---|
| Ethylenediamine | 10 ppm (25 mg/$M^3$) – OSHA PEL |
| Ethylenediamine | 10 ppm – ACGIH TWA (skin) |
| Ethylenediamine | 10 ppm (25 mg/$M^3$) – NIOSH REL (10-hour exposure) |
| Ethylenediamine | 1000 ppm – NIOSH IDLH (Immediately dangerous to life & health) |

**Engineering Controls:** General area dilution/exhaust ventilation.

**Respiratory Protection:** When respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with regulatory standards and/or industrial recommendations. Self-contained or supplied-air respiratory equipment is recommended.

**Eye/Face Protection:** Safety glasses with side shields, goggles or face shield are recommended.

**Skin Protection:** Skin contact should be minimized through the use of chemical-resistant gloves and boots, and suitable protective clothing.

**Work Practice Controls:** The following general measures should be taken when working or handling this material: 1) Do not store, use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored. 2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet. 3) Wash exposed skin promptly to remove accidental splashes of contact with this material.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical properties here represent typical properties of this product. Contact the manufacturer for exact specifications.

**Physical Appearance:** Clear liquid

**Odor:** Ammonia-like odor

**pH:** 11.9 (@ 25% aq, 77F, 25C)

**Specific Gravity:** 0.9

**Water Solubility:** Soluble

**Melting Point Range:** 47F (8.5C)

**Boiling Point Range:** 241-243F (116-117C)

**Freezing Point Range:** 51F (10.6C).

**Vapor Pressure:** 10.7 mm Hg at 68F (20C)

**Vapor Density:** 2.07 (air = 1).

## 10. STABILITY AND REACTIVITY

**Chemical Stability:** This material is stable under normal handling and storage conditions described in Section 7.

**Conditions to be Avoided:** Heat, open flame, sparks.

**Materials/Chemicals to be Avoided:** Strong oxidizing agents, acids, halogenated organic compounds, aldehydes, copper and copper alloys, nickel, cobalt, carbon disulfide, vinyl acetate.

**Hazardous Decomposition Products:** Oxides of carbon, oxides of nitrogen, ammonia.

**Hazardous Polymerization**: Not applicable

## 11. TOXICOLOGICAL INFORMATION

**Acute Eye Irritation**: Corrosive, rabbit.

**Acute Skin Irritation:** Corrosive, rabbit. Positive sensitization (guinea pig).

**Acute Dermal Toxicity:** $LD_{50}$ = 730 mg/kg, rabbit.

**Acute Respiratory Irritation**: Inhalation of 400 ppm for 5-10 seconds in humans caused severe nasal irritation.

**Acute Inhalation Toxicity:** No data available. However, this material, like many corrosive substances, when present in an aerosol form, may present a risk of pulmonary edema, which may be fatal. Systemic toxicity to high vapor concentrations causes damage to the kidneys, liver and lungs. Chemical is expected to be a respiratory sensitizer.

**Acute Oral Toxicity:** $LD_{50}$ = 500 mg/kg, rat.

**Chronic Toxicity:** This product does not contain any substances that are considered by OSHA, NTP, IARC or ACGIH to be "probable" or "suspected" human carcinogens. Negative mutagenic activity in the Chinese hamster ovary (CHO) and the sister chromatid exchange (SCE) studies, negative activity in the Ames test without activation, weakly positive in 2 strains in the presence of S9 activation. In a 2-year bioassay in rats, ethylenediamine, at oral concentrations up to 350 mg/kg/day, did not produce any evidence of carcinogenicity. In a lifetime skin-painting study, mice did not exhibit any statistically-significant increase in tumors, compared to the controls. In rats fed 0.5 g/kg/day for 2 generations, some reduction in body weight and microscopic changes of the kidneys and liver were observed. Liver lesions were more prevalent among female than male rats. Ethylenediamine, when administered by gavage to pregnant rabbits, resulted in no adverse effects upon prenatal viability, litter size, fetal weight or morphology. No additional test data found for product.

## 12. ECOLOGICAL INFORMATION

**Ecotoxicological Information**: 96-hour $LC_{50}$ = 115.7 mg/L (fathead minnow). 24-hour $EC_{50}$ = 14 mg/L, (daphnia). 21-Day reproduction study, NOEC = 2 mg/L (daphnia). 28-Day Early Life-Stage, NOEC >10 mg/L (Alaskan stickleback), 72hr EC50 = 71 mg/L, NOEC = 5.6 mg/L (algae).

**Chemical Fate Information:** Readily biodegradable. Activated sludge respiration inhibition test EC50 =1600 mg/L. Nitrifying bacteria respiration inhibition test EC50 =3.2 mg/L. EC50 = 29 mg/L (Pseudomonas putida)

## 13. DISPOSAL CONSIDERATIONS

**Waste disposal Method:** Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from Federal laws and regulations. Consult state and local regulations regarding the proper disposal of this material.

**Container Handling and Disposal:** Rinse containers before disposal. Do not allow rinsate to enter the water systems. **EPA Hazardous Waste = YES**

**EPA RCRA Hazardous Waste Codes:** "C" = Corrosive

## 14. TRANSPORTATION INFORMATION

**Note:** The listed transportation classification does not address regulatory variations due to changes in package size, mode of shipment or other regulatory descriptors.

**US Department of Transportation:**

Shipping name: Ethylenediamine
Hazard Class: 8, 3
ID#: UN1604
Packing Group: II
Labels: Corrosive, Flammable
Emergency Guide#: 132

## 15. REGULATORY INFORMATION

**Inventory Status:**

US (TSCA): Yes
Canada (DSL): Yes
Europe (EINECS/ELINCS): Yes
Australia (AICS): Yes
Japan (MITI): Yes
Korea (KECL): Yes
Philippines (PICCS): Yes

Where: Yes = all ingredients are listed on the inventory, Exempt = All ingredients are either on the inventory or exempt from the requirements of listing, No = Not determined, or one or more ingredients are not on the inventory and are not exempt from listing.

**SARA Title III Hazard Classes:**

Fire Hazard: Yes
Reactive Hazard: No
Release of Pressure: No
Acute Health Hazard: Yes
Chronic Health Hazard: No

## 15. REGULATORY INFORMATION (continued)

**SARA Extremely Hazardous Substances/CERCLA Hazardous Substances:** Ethylenediamine (100%), RQ = 5000 lbs (2270 kg).

**California Proposition 65:** This product does not contain any components that are regulated under Proposition 65.

## 16. OTHER INFORMATION

**National Fire Protection Association ("NFPA") Hazard Ratings:**

Health: 3 (Severe)

Flammability: 2 (Moderate)

Instability: 0 (Minimal)

**National Paint and Coatings Hazardous Materials Identification System ("HMIS") Hazard Ratings:**

Health: 3 (Severe)

Flammability: 2 (Moderate)

Reactivity: 0 (Minimal)

**Reason for Revision(s):** New MSDS

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**END OF MATERIAL SAFETY DATA SHEET**