



Material Safety Data Sheet

Product name Ethylenediamine

1. Identification of the substance/mixture and of the company/undertaking

- 1.1. Product name Ethylenediamine
- 1.2. CAS-No. 107-15-3
- 1.3. Relevant identified uses of the substance or mixture and uses advised against
- Identified uses Fuel additive. Fungicides. Polyamide resins. Chelants. Bleach activators. For industrial consumption as a component of a reaction system. Others. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.
- 1.4. Details of the supplier of the safety data sheet
- Company Glory Global CO.,LTD
- Address C-208, 10, Nowon-ro 15-gil, Nowon-gu, Seoul, Korea
- Emergency Phone +82 2 6223 0862

2. Hazards identification

2.1. Classification of the substance or mixture

- Hazard classification
- This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.
- Flammable liquids - Category 3
 - Acute toxicity - Category 4 - Oral
 - Acute toxicity - Category 4 - Inhalation
 - Acute toxicity - Category 3 - Dermal
 - Skin corrosion - Category 1B
 - Serious eye damage - Category 1
 - Respiratory sensitisation - Sub-category 1B
 - Skin sensitisation - Sub-category 1B

2.2. GHS Label elements, including precautionary statements

Pictogram



Signal word

DANGER!

Hazard statement(s)

Flammable liquid and vapour.
Harmful if swallowed or if inhaled
Toxic in contact with skin.
Causes severe skin burns and eye damage.
May cause an allergic skin reaction.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Precautionary code and statements

Prevention

- Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- Keep container tightly closed.
- Ground/bond container and receiving equipment.
- Use explosion-proof electrical/ ventilating/ lighting/ equipment.
- Use only non-sparking tools.
- Take precautionary measures against static discharge.
- Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
- Wash skin thoroughly after handling.
- Do not eat, drink or smoke when using this product.
- Use only outdoors or in a well-ventilated area.
- Contaminated work clothing should not be allowed out of the workplace.
- Wear protective gloves/ protective clothing/ eye protection/ face protection.
- In case of inadequate ventilation wear respiratory protection.

Response

- IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mouth.
- IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor
- If skin irritation or rash occurs: Get medical advice/ attention.
- If experiencing respiratory symptoms: Call a POISON CENTER or doctor/ physician.
- Wash contaminated clothing before reuse.

Storage

Store in a well-ventilated place. Keep cool.

Store locked up.

Disposal

Dispose of contents/ container to an approved waste disposal plant.

none

2.3, Hazards not otherwise classified (HNOC) or not covered by GHS

3. Composition/information on ingredients

3.1. Substances

Synonyms	Ethylenediamine; 1,2-diaminoethane
CAS-No.	107-15-3
EC No.	

No components need to be disclosed according to the applicable regulations.

4. First aid measures

4.1. Description of first aid measures

General advice

First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

If inhaled

Move person to fresh air. If not breathing, give artificial respiration: if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

In case of skin contact

Immediate continued and thorough washing in flowing water for at least 30 minutes is imperative while removing contaminated clothing. Prompt medical consultation is essential. Wash clothing before reuse. Properly dispose of leather items such as shoes, belts, and watchbands. Suitable emergency safety shower facility should be immediately available.

In case of eye contact

Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

If swallowed

Do not induce vomiting. Give one cup (8 ounces or 240 ml) of water or milk if available and transport to a medical facility. Do not give anything by mouth unless the person is fully conscious.

4.2. Most important symptoms and effects, both acute and delayed

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

4.3. Indication of any immediate medical attention and special treatment needed

Maintain adequate ventilation and oxygenation of the patient. May cause asthmalike (reactive airways) symptoms. Bronchodilators, expectorants, antitussives and corticosteroids may be of help. Due to irritant properties, swallowing may result in burns/ulceration of mouth, stomach and lower gastrointestinal tract with subsequent stricture. Aspiration of vomitus may cause lung injury. Suggest ndotracheal/esophageal control if lavage is done. Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Repeated excessive exposure may aggravate preexisting lung disease.

5. Firefighting measures

5.1. Suitable extinguishing media

Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

- 5.2. Special hazards arising from the substance or mixture During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Carbon monoxide. Carbon dioxide.
- 5.3. Advice for firefighters Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Eliminate ignition sources. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.
- 5.4. Further information No data available

6. Accidental release measures

- 6.1. Personal precautions, protective equipment and emergency procedures Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Ground and bond all containers and handling equipment. Vapor explosion hazard. Keep out of sewers. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8. Exposure Controls and Personal Protection.
- 6.2. Environmental precautions Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.
- 6.3. Methods and materials for containment and cleaning up Contain spilled material if possible.
Small spills: Absorb with materials such as: Clay. Dirt. Milsorb® . Sand. Do NOT use absorbent materials such as: Ground corn cobs. Moist organic absorbents. Peat moss. Remove with shovel. Large spills: Dike area to contain spill. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Pump into suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.
- 6.4. Reference to other sections For disposal see section 13.

7. Handling and storage

- 7.1. Precautions for safe handling Keep away from heat, sparks and flame. Do not get in eyes, on skin, on clothing. Do not swallow. Avoid prolonged or repeated contact with skin. Avoid breathing vapor. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling. No smoking, open flames or sources of ignition in handling and storage area. Electrically ground and bond all equipment. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. See Section 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION.
- 7.2. Conditions for safe storage, including any incompatibilities Minimize sources of ignition, such as static build-up, heat, spark or flame. Keep container tightly closed. Do not store in: Brass. Bronze. Copper. Copper alloys.
- 7.3. Specific end use(s) Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Component	Regulation	Type of listing	Value/Notation
Ethylenediamine	ACGIH	TWA	10 ppm
	OSHA Z-1	TWA	25 mg/m ³ 10 ppm
	ACGIH	TWA	Absorbed via skin

8.2. Exposure controls

Appropriate engineering controls

Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

Personal protective equipment

- Eye/face protection
- Skin protection
- Body Protection
- Respiratory protection

Use chemical goggles. If exposure causes eye discomfort, use a fullface respirator. suitable protective gloves.

suitable protective clothing.

Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. Selection of air-purifying or positivepressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus. In confined or poorly ventilated areas, use an approved selfcontained breathing apparatus or positive pressure air line with auxiliary self-contained air supply.

The following should be effective types of air-purifying respirators: Organic vapor cartridge.

9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Liquid. Colorless to yellow
Odour	Ammoniacal
Odour Threshold	No test data available
pH	11.5 Literature 1% aqueous solution.
Freezing point	11 °C (52 °F) Literature
Initial boiling point	117 °C (243 °F) Literature
Flash point	closed cup 38 °C (100 °F) Tag Closed Cup ASTM D56
Evaporation rate	0.9 Literatur
Flammability (solid, gas)	Not applicable to liquids
Upper/lower flammability or explosive limits	14.4 % vol Literature , 4.2 % vol Literature
Vapour pressure	9.75 mmHg Literature
Vapour density	2.1 at 20 °C (68 °F) Literature
Relative density	0.897 at 20 °C (68 °F) / 20 °C Literature
Water solubility	1000 g/L at 20 °C (68 °F) Literature
Partition coefficient: n-octanol/water	log Pow: -1.6 Measured
Auto-ignition temperature	385 °C (725 °F) Literature
Decomposition temperature	No test data available
Dynamic Viscosity	1.265 – 1.725 cP at 20 °C (68 °F) Literature
Kinematic Viscosity	No test data availab
Explosive properties	Not explosive
Oxidizing properties	No
Relative molecular mass	60.10 g/mol Literature
Molecular formula	C2H8N2
9.2. Other safety information	No data available

10. Stability and reactivity

10.1. Reactivity	No data available
10.2. Chemical stability	Thermally stable at typical use temperatures.
10.3. Possibility of hazardous reactions	Polymerization will not occur.
10.4. Conditions to avoid	Exposure to elevated temperatures can cause product to decompose. Reaction with carbon dioxide may form an amine carbamate. Smoke may be generated depending on vapor pressure of mixture. Product absorbs carbon dioxide from the air
10.5. Incompatible materials	Avoid contact with oxidizing materials. Avoid contact with: Acids. Acrylates. Alcohols. Aldehydes. Halogenated hydrocarbons. Ketones. Nitrites. Avoid contact with metals such as: Brass. Bronze. Copper alloys. Avoid contact with absorbent materials such as: Ground corn cobs. Moist organic absorbents. Peat moss.
10.6. Hazardous decomposition products	Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon monoxide. Carbon dioxide. Ammonia. Volatile amines. Nitrogen oxides.

11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity	Low toxicity if swallowed. Swallowing may result in gastrointestinal irritation or ulceration.
Skin corrosion/irritation	Swallowing may result in burns of the mouth and throat. Brief contact may cause severe skin burns. Symptoms may include pain, severe local redness and tissue damage. Classified as corrosive to the skin according to DOT guidelines.
Serious eye damage/eye irritation	May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur. Vapor may cause eye irritation experienced as mild discomfort and redness.
Respiratory or skin sensitisation	Has caused allergic skin reactions in humans. Individuals who have had an allergic skin reaction to similar materials may have an allergic skin reaction to this product. The similar material(s) is/are: Triethylenetetramine (TETA). Has demonstrated the potential for contact allergy in mice. Has caused allergic skin reactions when tested in guinea pigs.
Germ cell mutagenicity	May cause allergic respiratory reaction. No data available
Carcinogenicity	Did not cause cancer in laboratory animals.
Reproductive toxicity	In animal studies, did not interfere with reproduction.

Specific target organ toxicity – single exposure	Evaluation of available data suggests that this material is not an STOT–SE toxicant.
Specific target organ toxicity – repeated exposure	In animals, effects have been reported on the following organs: Kidney. Liver.
Aspiration hazard	Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.
Additional Information	RTECS: Not available
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.	

12. Ecological information

12.1. Toxicity	
Toxicity to fish	Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested). LC50, <i>Poecilia reticulata</i> (guppy), semi-static test, 96 Hour, 640 mg/l
Toxicity to daphnia and other aquatic invertebrates	EC50, <i>Daphnia magna</i> (Water flea), static test, 48 Hour, 16.7 mg/l
Toxicity to algae/aquatic plants	EC50, <i>Pseudokirchneriella subcapitata</i> (green algae), static test, 72 Hour, Growth rate inhibition, 645 mg/l
Toxicity to bacteria	EC50, Bacteria, 16 Hour, 500 – 1,000 mg/l
Chronic aquatic toxicity	NOEC, Fish., 28 d, survival, > 10 mg/l
12.2. Persistence and degradability	Readily biodegradable
Biodegradability	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. 10-day Window: Not applicable
12.3. Bioaccumulative potential	Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Partition coefficient: n-octanol/water(log Pow): –1.6 at 20 °C Measured Bioconcentration factor (BCF): 0.07 Fish. Estimated.
12.4. Mobility in soil	Potential for mobility in soil is very high (Koc between 0 and 50). Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process. Partition coefficient(Koc): 4766 Measured
12.6. Other adverse effects	No data available

13. Disposal considerations

13.1 Disposal methods	DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations.
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14. Transport information

14.1. DOT (US)	Proper shipping name: Ethylenediamine UN number: UN 1604 Class: 8 (3) Packing group: II Reportable Quantity: Ethylenediamine
14.2. IMDG	Proper shipping name: Ethylenediamine UN number: UN 1604 Class: 8 (3) Packing group: II Marine pollutant: No Transport in bul: Consult IMO regulations before transporting ocean bulk accordina to Annex I or II of MARPOL 73/78 and the IBC or IGC Code
14.3. IATA	Proper shipping name: Ethylenediamine UN number: UN 1604 Class: 8 (3) Packing group: II
14.4. Environmental Hazard	

15. Regulatory information

15.1. OSHA Hazard Communication Standard	This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
15.2. Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312	Fire Hazard Acute Health Hazard Chronic Health Hazard
15.3. Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.
15.4. Pennsylvania Worker and Community Right-To-Know Act	To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

15.5. California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

15.6. United States TSCA Inventory (TSCA)

All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory

16. Other information

16.1. Further information

Always work safely around open hatches on bulk tanks. The low density makes flotation difficult for immersed person.

