


Number: 056

Section 1. Product and Company Identification

Product name: Ethylene glycol
Synonyms: -
Recommended use and Restrictions on use: Coolant and antifreeze; Bitumen emulsion coatings; heat transferr; low-pressure laminates; brake oil; Ethylene glycol-[1,2]-diacetate; Polyester fibers and films; refractory explosives; Solvent; extractants for various purposes; solvent mixtures of cellulose esters and ethers, in particular celluloid (cellophane) cosmetics (up to 5%); Enamel; Alkyd resins; printing ink; wood staining; adhesives; leather dyeing; fabric processing; Tobacco; de-icing fluid composition of airstrips; Atomic pen and ink; foam stabilizers; Wetting agent
Manufacturer, Importer, or Supplier: Shiny Chemical Industrial Co., Ltd. Address: No.5, Yeong Gong 1 st Rd, Yeong An Dist., Kaohsiung 82841, Taiwan, R.O.C. Telephone: +886-7-8619171 ext. 711~714
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Section 2. Hazards Identification

Classification: 1. Acute Toxicity: Oral, Category 5 2. Specific target organ toxicity - repeated exposure Category 2 3. Serious Eye Damage/Eye Irritation, Category 2B
Label elements:  Hazard pictograms: Health Hazard Signal word: Warning Hazard Statements: 1. Harmful if swallowed. 2. May cause damage to organs through prolonged or repeated exposure. 3. Causes eye irritation Precautionary statements: 1. Avoid contact with eyes. 2. Remove clothes as soon as they are contaminated Keep containers in a

well-ventilated place.

3. Avoid exposure to this substance - use as directed by special instructions.

Other Hazards: -

Section 3. Composition/Information on Ingredients

Pure substance

Chemical Name: Ethylene glycol

Synonyms: Glycol、Ethylene alcohol、1,2-Dihydroxyethane、1,2-Ethanediol、Ethylene dihydrate、Glycol alcohol

CAS NO.: 107-21-1

Weight: 100%

Section 4. First Aid Procedures

Description of first aid measures:

- Inhalation:

1. Remove contamination sources or move victims to fresh air.
2. Get medical attention immediately.

- Skin contact:

1. Take off immediately all contaminated clothing.
2. Wash skin with warm water for at least 10 minutes.
3. If symptoms persist, call a physician.
4. Get medical attention if irritation develops or persists.
5. Clean the pollutant clothes, shoes and paper ornaments before discard or use them.

- Eye contact:

1. Immediately lift eyelids, flushing eyes with plenty of warm water for at least 10 minutes.
2. Wash repetitively if irritation persists.
3. Get medical attention immediately.

- Ingestion:

1. Never give anything by mouth to an unconscious person.
2. Don't induce vomiting. Have victim drink 240~300 mL of water.
3. Provide the water for patient's mouth rinsing after patient vomited.
4. If the affected person stop breathing, call the trained members to proceed artificial respiration; once the heart stop beating, proceed CPR.
5. Refer for medical attention immediately.

The most Important Symptoms and Hazardous Effects:

1. Through the skin eczema, ethylene glycol will be absorbed
2. A dose of 100ml will lead to death.

Protection for emergency personnel: Use appropriate personal protective equipment such as class C clothing to take first aid in a safety area.

Notes to Physicians: If swallowed, consider gastric lavage.

Section 5. Firefighting Measures

Suitable extinguishing media: chemical dry, alcohol foam, carbon dioxide , polymer foam, Water mist.

Special hazards during firefighting: extinguishing fires with water mist or foam may foam.

Firefighting procedures:

1. Spray water mist on the surface of the liquid, because it cools and foams, it can extinguish the fire
2. If the leakage ignites, the vapor can be dispersed with water mist

Protective equipment for firefighters: Extinguishing staffs should wear an approved/certified respirator, splash goggles, and firefighting coats.

Section 6. Accidental Release Measures

Personal precautions:

1. Restrain personnel from close to spilled areas before totally cleaning out.
2. Confirm the cleaning work be responsible by trained staffs.
3. Wear appropriate personal protective equipments.

Environmental precautions:

1. Ventilate this area.
2. Remove all sources of ignition.
3. Report to governmental safety and hygiene institutes and related units.

Methods for cleaning up:

1. Do not touch spilled material.
2. Avoid leaks flushing to sewers or confined areas.
3. Try to stop or reduce leaks in safety condition.
4. Use sand, soil, and inert absorbing agents to block leaks.
5. Small spill: Use the material, not react with spill, to absorb. Contaminated absorbing agents have same risk as spill. Place in covered and labeled containers. Spray water on spilled areas. Use plenty of water to dilute small spill.
6. Large spill: Contact fire control, urgent handling units and suppliers to seek aid.

Section 7. Handling and Storage

Handling:

1. This substance is very toxic and requires engineering control and protective equipment, and staff should be properly trained and informed of the hazards and safe use of this substance.

2. Do not handle this substance alone, and if it is released, immediately put on respiratory protection and leave until the severity of the release is determined.
3. Check the container for leakage before operation, and consider operating the substance with a closed system.
4. Avoid generation of vapors and mist and prevent vapors and mist from entering the air in the work area.
5. Vapor is heavier than air and will settle in low-lying or closed areas, storage or poorly ventilated areas.
6. All opening, pouring and mixing operations should be operated upwind.
7. Do not return contaminated liquid to original storage container.

Storage:

1. Store and operate away from heat sources, incompatible substances to avoid toxic thermal decomposition or violent reactions.
2. Empty barrels, containers and fittings may still have hazardous residues and no welding, cutting, drilling or other thermal work is permitted until cleaned up.
3. Use in well-ventilated areas with minimal operating volume and separated from storage areas.
4. Do not use with incompatibilities (e.g. strong oxidants, strong bases), it will cause a violent reaction.

Section 8. Exposure controls

Engineering controls:

1. Integral ventilation.
2. Local venting may be required for heating and mist formation.
3. Supply adequate fresh air to replenish the exhausted air.

Control parameters

TWA	STEL	CEILING	BEIs
-	-	50 ppm(Vapor) TWA 10 mg/m ³ (Mist) 15 mg/m ³ (Mist)	-

Personal protective equipment:

- Respiratory protection: No special specifications required.
- Hand protection: Natural rubber, neoprene, polyvinyl chloride, butyl rubber, Viton, Teflon, Saranex, Barricade, 4H, Terllchem HPS, polyethylene, nitrile rubber and other materials of impermeable gloves.
- Eye protection: Chemical safety goggles, full-type masks.
- Skin and physical protection: The above rubber jumpsuit, work pants, apron, work

boots.
Hygiene measures: 1. Remove contaminated clothing quickly as possible after work. Clean clothing before reuse or abandon. Tell cleaning staffs the harmfulness. 2. Forbid smoking or eating in workplace. 3. After handling this material, wash hands thoroughly. 4. Keep workplace clean.

Section 9. Physical and Chemical Properties

Appearance: Clear colorless hygroscopic liquid	Odor: Sweetness
Odor threshold: 0.08 ppm	Melting point: -13°C
pH : 7(Neutral)	Boiling point/Boiling range: 198°C
Flammability (solid, gas): -	Flash point: 111°C
Decomposition temperature: -	Test method: close cup
Auto-ignition temperature: 398°C	Explosion limits: 3.2% ~ 15.3%
Vapor pressure: 0.05 mmHg	Vapor density: 2.14 (air=1)
Density: 1.1135 (Water = 1)	Solubility: Totally soluble in water
Partition coefficient (n-octanol/water, log K _{ow}): -1.93~-1.36	Volatility rate: - (N-butyl acetate=1)

Section 10. Stability and Reactivity

Chemical stability: Stable under ordinary conditions.
Possibility of hazardous reactions: 1. Avoid temperatures above 111°C. 2. Strong oxidants (e.g. perchloric acid, nitrate, caseic acid): Increase the risk of fire and explosion. 3. Phosphorus trisulfide: Explosive at high temperatures. 4. Strong bases (such as sodium hydroxide): Produce a decomposition reaction. 5. Perchloric Acid: Violent decomposition occurs. 6. Strong acids (e.g. oleum, 96% sulfuric acid, chlorosulfonic acid): In a closed container, the degree and pressure will increase. 7. Direct current silver-copper wire: Contact with it will catch fire. 8. Aluminum: Ethylene glycol will corrode it above 100°C.
Conditions to avoid: 1. Avoid temperatures above 111°C. 2. Direct current silver-copper wire.
Materials to avoid: Strong oxidants (e.g. perchloric acid, nitrate, caseic acid), phosphorus trisulfide, strong bases (e.g. sodium hydroxide), perchloric acid, strong

acids (e.g. oleum, 96% sulfuric acid, chlorosulfonic acid), aluminum.

Hazardous decomposition products: -

Section 11. Toxicological Information

Exposure Route: Skin, inhalation, ingestion, eye.

Symptoms: Irritation, respiratory failure, cardiovascular failure, pulmonary edema.

Acute toxicity:

- Inhalation:

1. Vapors and mists can cause irritation to the nose and throat.
2. Concentrations above 56 ppm will not be tolerated for too long due to throat irritation.
3. Vapor pressure is low, not causing overt poisoning at room temperature but exposure to mists at elevated temperatures can be harmful.

- Skin:

1. Liquid can cause irritation.
2. Through skin eczema, ethylene glycol will be absorbed, and the symptoms will be similar to ingestion.

- Eyes:

1. The liquid causes irritation and inflammation of the eyelids, but does not cause permanent damage.
2. Vapor and mist are irritating to eyes.

- Ingestion:

1. Causes nausea, vomiting, lower abdominal pain, weakness, drowsiness, dizziness, trance, spasms, shock and other symptoms of central nervous system depression.
2. Death will result from respiratory failure and cardiovascular failure.
3. A dose of 100 ml can be fatal or, if alive, kidney failure may occur a few days later.
4. In some cases, it can cause visual impairment.

- LD₅₀ (animal test, entry): 4,710 mg/kg (rat, oral)

- LC₅₀ (animal test, entry): 12mg/m³/3 day(s) (rat, eyes) : Cause irritation.

Chronic / Long-term toxicity:

- Inhalation:

1. Exposure to a concentration of 12ppm for 22 hours a day for 28 days can cause only mild throat irritation, headache, and lower back pain.
2. Long-term exposure to vapors and droplets generated above 100°C can cause loss of consciousness and nystagmus. 50 gm/kg (6-15 days gestation, swallowed) causes abnormal embryonic development.

Section 12. Ecological Information

Ecological toxicity:
1. LC ₅₀ (fish): 18500-4100mg/L/96 hour(s)
2. EC ₅₀ (aquatic invertebrates): -
3. Bioconcentration factor (BCF):10~190
Persistence and degradability:
1. Ethylene glycol is broken down and excreted in the body.
2. Theoretically, in the presence of 100% oxygen, ethylene glycol will be completely decomposed in 1-4 days, but in practice it will take about several weeks.
3. It will be decomposed in water and will not be adsorbed on sediment.
<ul style="list-style-type: none"> • Half-life (Air): 8.3 ~ 83 hours • Half-life (Water surface): 48 ~ 288 hours • Half-life (Groundwater): 96 ~ 576 hours • Half-life (Soil): 48 ~ 288 hours
Bioaccumulative potential: -
Mobility in soil: When ethylene glycol is released into the soil, it will be involved in the ground, and its distribution is unknown.
Other adverse effects: -

Section 13. Disposal Considerations

Waste disposal:
1. Refer to relevant laws and regulations.
2. Store waste to be treated in accordance with storage conditions.
3. Disposal is carried out by specific incineration or safe and hygienic burial methods.

Section 14. Transport Information

United Nations Number (UN No.): -
UN Proper Shipping Name: -
Transport Hazard classes: -
Packaging Group: -
Marine pollutant (Yes/No): -
Specific Transport Measures and Precautionary Conditions: -

Section 15. Regulatory Information

Applicable Regulations:
1. Occupational Safety and Health Act.
2. Regulations for the Labeling and Hazard Communication of Hazardous Chemicals.
3. Methods and Facilities Standards for the Storage, Clearance and Disposal of Industrial Waste.
4. Standards of Permissible Exposure Limits at Job Site.

5. Public Hazardous Substances & Flammable Pressurized Gases Establishment Standards & Safety Control Regulations.
6. Regulations Governing Designating and Handling of Priority Management Chemicals.
7. Occupational Safety and Health Facilities Regulations.
8. Hazardous Chemicals Evaluation and Classification Management Measures.

Section 16. Other Information

References	<ol style="list-style-type: none"> 1. HSDB database, 2015. 2. ChemWatch database, 2015. 3. CHEMINFO database, 2015. 4. European Chemicals Agency (ECHA) 5. Suggestions on the classification of Japanese products parity technology base institutions 6. Global Harmonization System for Chemicals
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Notes	The symbol " - " in this sheet indicates no available information; the symbol " / " indicates the information is not applicable to the substance.