Product Safety Assessment
Ethylene Glycol Phenyl Ether

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Names[1]

- CAS No. 122-99-6
- Ethylene glycol monophenyl ether
- (2-Hydroxyethoxy)benzene
- 2-Hydroxyethyl phenyl ether
- beta-Hydroxyethyl phenyl ether
- EC No. 204-589-7
- 2-Phenoxyethanol
- beta-Phenoxyethanol
- DOWANOL™ EPh glycol ether

Product Overview

- Ethylene glycol phenyl ether is a slow-evaporating, colorless to yellow liquid with a mild odor. It can be used in dyeing synthetic fibers, both as a dye solubilizer and as a dye carrier. Ethylene glycol phenyl ether can also be used in paints and varnishes, soaps, cosmetics, perfumes, and cleaning products.[2] Ethylene glycol phenyl ether is an ethylene-series (or E-series) aromatic glycol ether and is sold by Dow under the trade name DOWANOL™ EPh glycol ether. See Product Uses.
- Eye contact may cause moderate irritation or moderate corneal injury. Repeated skin contact may result in absorption of harmful amounts. Swallowing small amounts is unlikely to result in injury. Swallowing large amounts may result in injury.[3] Ethylene glycol phenyl ether is a high boiling liquid with a low vapor pressure, so exposure to vapors is unlikely at room temperature.[4] See Product Description and Health Information.
- Consumer exposure to ethylene glycol phenyl ether may occur through the use of paints and varnishes, soaps, cosmetics, and cleaning products or through inhalation of vapor through the material's use as a perfume fixative. Check product labels for content and ventilation requirements. See Exposure Potential.
- Ethylene glycol phenyl ether is thermally stable at typical storage and use temperatures. It can oxidize at elevated temperatures. Gas generation during decomposition can cause pressure build-up in closed systems. See Physical Hazard information.
- Ethylene glycol phenyl ether is readily biodegradable and has a low potential for bioconcentration. It is practically nontoxic to aquatic organisms.[3] See Environmental Information.

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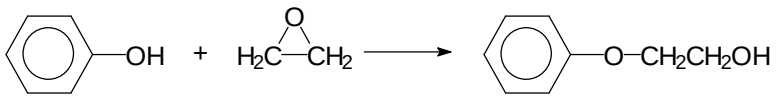
Manufacture of Product

- **Capacity**[5] –Dow has glycol ether production facilities in the following U.S. locations: Taft[†] and Plaquemine, Louisiana; and Freeport and Seadrift[†], Texas. Dow also has production facilities in San Lorenzo, Argentina, and Stade, Germany.
- **Process** – Ethylene glycol phenyl ether is produced by reacting phenol with ethylene oxide in an alkaline medium, using a continuous closed reactor.[6] The chemical reaction is shown below.[7,8]



Phenol | Ethylene oxide | Ethylene glycol phenyl ethe

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Product Description

Ethylene glycol phenyl ether is a clear to yellow liquid with a mild odor. It has good coalescing ability, a high polymer solvency, a low evaporation rate, and a wide range of applications.[2] It is an ethylene-series (or E-series) glycol ether that is sold by The Dow Chemical Company under the trade name DOWANOL™ EPh glycol ether.

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Product Uses[2,9,10,11]

Glycol ethers are primarily used as formulation solvents in applications such as cleaning fluids, paints, coatings, and inks. Ethylene glycol phenyl ether is also used to formulate cosmetics and cleaning products.

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Exposure Potential[3]

Ethylene glycol phenyl ether is used in the production of industrial and consumer products. Based on these uses, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in a glycol ethers manufacturing facility or in the various industrial or manufacturing facilities that use glycol ethers in production. Those working with glycol ethers in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Adequate ventilation should be used to maintain vapor levels below recommended guidelines. Each manufacturing facility should have a thorough training program for employees and appropriate work processes and safety equipment in place to limit unnecessary exposure. See Health Information.
- **Consumer exposure to products containing glycol ethers** – Ethylene glycol phenyl ether may be present in paints, varnishes, inks, soaps, cleaning products, and perfumes. Read product labels carefully for content. Use safety glasses/goggles and chemically resistant gloves and work in a well-ventilated area when using products that contain ethylene glycol phenyl ether. Follow product instructions carefully to minimize the risk of exposure. See Health Information.
- **Environmental releases** – In the event of a small spill, absorb glycol ethers with materials such as sand or vermiculite. Collect spillage in suitable and properly labeled containers. Prevent the material from entering soil, ditches, sewers, waterways, and/or groundwater. Use

[†] Site of Union Carbide Corporation, a wholly owned subsidiary of The Dow Chemical Company

appropriate safety equipment for clean up. See Environmental, Health and Physical Hazard Information.

- **Large release** – Industrial spills or releases are infrequent and are generally contained. If a large spill does occur, the material should be collected in suitable and properly labeled containers and disposed of according to applicable governmental requirements. Spills of glycol ethers on hot fibrous insulation may reduce the autoignition temperature, resulting in the potential for spontaneous combustion. If glycol ethers are present in a fire situation, they can produce carbon monoxide (highly toxic) and carbon dioxide (an asphyxiant at sufficient concentrations). Immediately withdraw all personnel from the area. Water (fog or fine spray) should be used to cool fire-exposed containers and the fire-affected zone until the fire is out and danger of re-ignition has passed. Firefighting personnel may also use dry-chemical or carbon-dioxide fire extinguishers or foam. Alcohol-resistant foams are preferred. General-purpose synthetic foams or protein foams will be less effective. Fight fire from a protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Do not use a direct water stream, as this may spread the fire. Move containers from the fire area if it is possible to do so without hazard, since containers may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Water fog, applied gently, may be used as a blanket to extinguish fires. Emergency personnel should wear proper protective equipment, including self-contained breathing apparatus (SCBA), and follow emergency procedures carefully. When relevant in scale or risk, the community should be notified of the hazards associated with the specific release event. See Environmental, Health and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet (SDS)

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Health Information[3,12]

Eye contact with ethylene glycol phenyl ether may cause moderate irritation and corneal injury.

Prolonged skin exposure is unlikely to cause significant irritation. A more severe response may result on covered skin (under clothing, gloves). Prolonged skin contact is unlikely to result in absorption of harmful amounts. However, repeated skin contact may result in absorption of harmful amounts.

In animal studies, excessive exposure caused hemolysis (breakage of red blood cells) and secondary effects to the kidneys and liver. Hemolysis impairs the blood's ability to transport oxygen and excessive exposure to ethylene glycol phenyl ether can aggravate preexisting diseases of the kidneys, liver or blood (like anemia). However, human red blood cells have been shown to be significantly less susceptible to hemolysis than those of the test animals.

At room temperature, vapor exposure is minimal because of this material's low volatility. However, vapor from heated material may cause eye and nose irritation and cause drowsiness.

Ethylene glycol phenyl ether has a low toxicity if swallowed. Small amounts swallowed incidental to normal handling operations are not likely to cause injury. However, swallowing larger amounts may cause injury.

In animal studies, effects from repeated exposure have been reported on the red blood cells, kidney, liver, thyroid, and respiratory tract. Ethylene glycol phenyl ether did not cause birth defects or other effects in the fetus, even at doses that caused toxic effects in the mother. Repeated exposures had no effect on reproductive organs. *In vitro* genetic toxicity and animal genetic toxicity studies were both negative.

For more information, see the relevant Safety Data Sheet (SDS)

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Environmental Information[3,13]

Ethylene glycol phenyl ether is readily biodegradable, and its potential for bioconcentration is low. Its potential for mobility in soil is high. It is practically nontoxic to aquatic organisms.

Additional environmental information for ethylene glycol phenyl ether is available in the *Ecological and Toxicological Data of DOW Glycol Ethers* brochure.

For more information, see the relevant SDS.

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Physical Hazard Information[3]

Ethylene glycol phenyl ether is thermally stable at typical storage and use temperatures. Ethylene glycol phenyl ether can oxidize at elevated temperatures. Gas generation during decomposition can cause pressure build-up in closed systems. Do not store ethylene glycol phenyl ether in aluminum, copper, galvanized-iron, or galvanized-steel containers. Avoid contact with strong acids, bases, and oxidizers. Spills of ethylene glycol phenyl ether on hot fibrous insulation may reduce the autoignition temperature of the material, resulting in the potential for spontaneous combustion.

For more information, see the relevant SDS

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Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of this material. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant SDS or Contact Us.

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Additional Information

- Safety Data Sheet (http://www.dow.com/webapps/msds/msdssearch.aspx)
- *DOWANOL*™ *EPh, Technical Data Sheet*, The Dow Chemical Company, Form No. 110-00591-0314 (http://www.dow.com/webapps/lit/litorder.asp?filepath= oxysolvents/pdfs/noreg/110-00591.pdf&pdf=true)
- *Glycol Ethers*, The Dow Chemical Company, Form No. 110-00965-1101 AMS, November 2001, (http://www.dow.com/webapps/lit/litorder.asp?filepath=oxysolvents/pdfs/noreg/110-00965.pdf&pdf=true)
- *Ecological and Toxicological Data of DOW Glycol Ethers*, The Dow Chemical Company, Form No. 170-00761-0304, March 2004, (http://www.dow.com/webapps/lit/litorder.asp?filepath= oxysolvents/pdfs/noreg/110-00761.pdf&pdf=true)

For more information about this product, visit Dow's Oxygenated Solvents web site. (www.dow.com/oxysolvents)

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References

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[1] *Screening Information Data Set (SIDS) Initial Assessment Report for SIAM 18 – Ethylene Glycol Phenyl Ether Category: CAS No. 122-99-6*, Organisation for Economic Co-operation and Development (OECD),United Nations Environment Programme (UNEP): Paris, France, 20-23 April, 2004, page 6.
[2] *DOWANOL™ EPh, Technical Data Sheet*, The Dow Chemical Company
[3] *DOWANOL EPh Glycol Ether, Safety Data Sheet for the US*, The Dow Chemical Company
[4] *Ethylene Glycol Phenyl Ether*, SIDS Initial Assessment Report, UNEP Publications, September 8, 2005, page 5.
[5] "Glycol Ethers," *Chemical Economics Handbook (CEH) Marketing Research Report*, Stanford Research Institute (SRI) Consulting, July, 2004, pages 4 and 18.
[6] *Ethylene Glycol Phenyl Ether*, SIDS Initial Assessment Report, UNEP Publications, September 8, 2005, page 7.
[7] "Glycol Ethers," *Chemical Economics Handbook (CEH) Marketing Research Report*, SRI Consulting, July, 2004, page 13.
[8] *Chemistry of Dow Glycol Ether Products*, The Dow Chemical Company, Form No. 110-00657-0304, March 2004, pages 1–2.
[9] "Glycol Ethers," *Chemical Economics Handbook (CEH) Marketing Research Report*, Stanford Research Institute (SRI) Consulting, July, 2004, page 8.
[10] *SIAR for SIAM 18 – Ethylene Glycol Phenyl Ether Category: CAS No. 122-99-6*, OECD, UNEP: Paris, France, 20-23 April, 2004, page 7.
[11] Estimates by The Dow Chemical Company.
[12] *Ecological and Toxicological Data of Dow Glycol Ethers*, The Dow Chemical Company, Form No. 170-00761-0304, March 2004, pages 3–9.
[13] *Ecological and Toxicological Data of Dow Glycol Ethers*, The Dow Chemical Company, Form No. 170-00761-0304, March 2004, pages 1–3 and 9.

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NOTICES:

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