

## ETHYLENE OXIDE Product Stewardship Summary

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CAS number

75-21-8

Chemical formula

C<sub>2</sub>H<sub>4</sub>O

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### What is ethylene oxide?

Ethylene oxide (EO) is a colourless, highly reactive and flammable gas at room temperature. It is produced by direct oxidation of ethylene with air or oxygen. Because EO reacts readily with many chemicals, it is one of the most versatile intermediates and is used to produce many derivative products.

### How is ethylene oxide used?

Ethylene oxide is used in the production of:

- ethylene glycols (used in antifreeze, polyester for fibres, polyethylene terephthalate (PET) bottles and containers, gas dehydration, heat transfer liquids, solvents, and polyesters);
- poly(ethylene) glycols (used in cosmetics, pharmaceutical preparations, lubricants, paint solvents, and plasticisers);
- ethylene oxide glycol ethers (used in brake fluids, detergents, and paint and lacquer solvents);
- ethanolamines (used in soaps, detergents, natural gas purification, and textile finishing);
- ethoxylated products of fatty alcohols (used in detergents, surfactants, emulsifiers, and dispersants).

### Health, Safety and Environmental considerations

In its gas form, EO is highly reactive and flammable.

EO is classified as a human carcinogen and can cause damage to reproductive organs. Liquid EO evaporates rapidly and can cause freezing of the skin as a consequence. It is also highly irritating to the eyes and skin and even in dilute solutions can cause blistering or severe damage to the skin or eyes.

The American Conference of Governmental Industrial Hygienists (ACGIH) has assigned an eight-hour occupational exposure limit of 1 part per million (1ppm). EO does not have good warning properties by smell.

EO is harmful to aquatic organisms. It is biodegradable and has a low potential to bioaccumulate.

## **Storing and transporting ethylene oxide**

EO is transported in the US by rail to customers and by pipeline to internal users. In Europe, it is transported by truck, rail, pipeline and occasionally on cross channel ferry. EO is supplied to customers from Singapore via pipeline.

## **Risk Characterization Summary**

Risks associated with exposure to this product have been evaluated for the following “chain-of-commerce” activities: manufacture, storage, product transfer, transportation, and customers/markets. Due to health, safety and environmental considerations, it is only manufactured, stored and transported to customers in closed systems. Likewise, customers are limited to those who only use the product in closed systems. Proper equipment design and handling procedures maintain low risk from exposure. As such, the risks associated with the product are judged to be low.

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This product stewardship summary is intended to give general information about the chemical or categories of chemicals addressed. It is not intended to provide an in-depth discussion of health and safety information. Additional information is available through the chemical’s applicable Material Safety Data Sheet, which should be consulted before use of the chemical. This product stewardship summary does not supplant or replace required regulatory and/or legal communication documents.