

ETHYLENE OXIDE



A Critical Building Block for

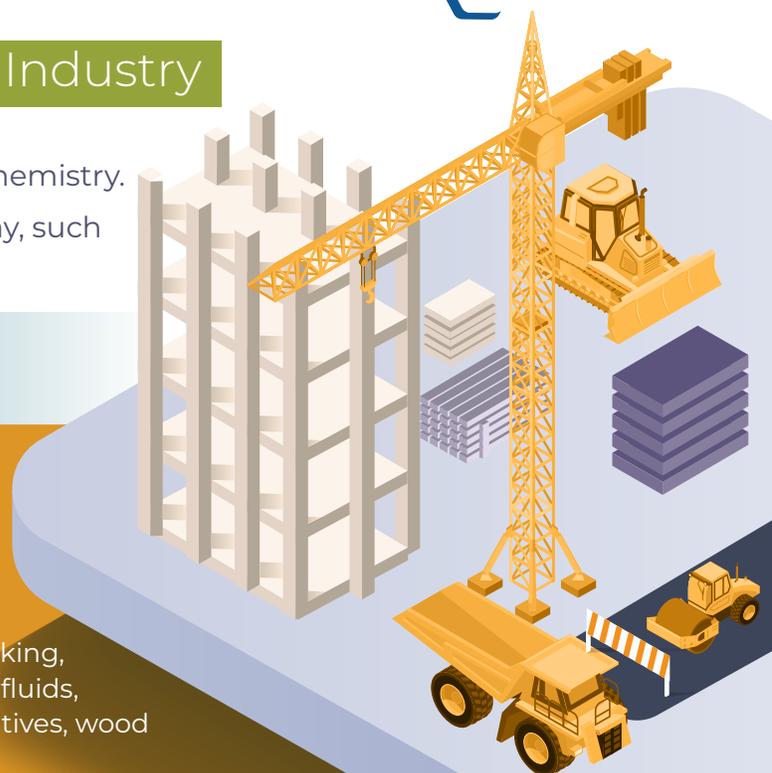
the Building and Construction Industry

Ethylene oxide (EO) is a versatile building block of chemistry. It helps make many of the products we use every day, such as plastics, safety glass, adhesives, and textiles.

One area where ethylene oxide is used is in the building and construction industry in the U.S.

How is it used?

In building and construction, ethylene oxide is an essential raw material for many important products including adhesives, architectural coatings, asphalt & cement additives, architectural glass, commercial & residential roofing, carpet backing, drainage aids, epoxy curing agents, metalworking fluids, paints, polyurethanes, solvents, textiles/textile additives, wood & water treatments.



- ✓ Ethylene oxide plays an important role in processing resources such as minerals into usable products. Building and construction products such as asphalt, cement, solvents, and wood treatments are manufactured from other chemical-based products formulated using ethylene oxide.
- ✓ Ethylene oxide is used in the production of polyethylene glycol (PEG), which is a polymer commonly employed in the construction industry that melts at a certain temperature, absorbs and stores heat, and maintains its temperature.¹ For instance, applying Polyethylene Glycol-400 in self-curing concrete helps to reduce self-desiccation and improve mechanical characteristics. PEG-400 retains the internal water for proper hydration of cement in concrete as compared to conventional concrete.²
- ✓ Ethylene oxide is a key raw material in the production of polyurethane foams. Polyurethane foams are versatile materials used in construction for insulation and other purposes. They provide thermal insulation in buildings, helping to regulate temperature and reduce energy consumption.
- ✓ Ethylene oxide is a precursor in the production of ethylene glycol, which is widely used as an antifreeze agent and machinery coolant. Ethylene glycol is added to construction materials, such as concrete,³ to prevent freezing and cracking in cold weather.
- ✓ Polyester resins are used to produce various industrial products, including coatings, adhesives, and laminates. They are also used to reinforce composite materials.

The demands on our nation's building and construction industry continue to grow, and overly conservative restrictions on the production of ethylene oxide could put the needs of the \$2.1 trillion worth of structures each year and 8 million jobs⁴ at risk. Our member companies are dedicated to the responsible manufacture and use of ethylene oxide, and we support strong, science-based regulation of this important chemistry.

¹ Zhe Liu, et al. "Effect of High-Temperature-Resistant Epoxy Resin/Polyethylene Glycol 2000 Composite Stereotyped Phase Change Material Particles on Asphalt Properties." *Construction and Building Materials*, Elsevier, 23 June 2021, www.sciencedirect.com/science/article/abs/pii/S0950061821017670.

² Khushpreet Singh, et al. "Mechanical Properties of Self Curing Concrete Studied Using Polyethylene Glycol-400: A-Review." *Materials Today: Proceedings*, Elsevier, 6 Oct. 2020, www.sciencedirect.com/science/article/abs/pii/S2214785320365445.

³ Portland Cement Association. *Freeze-Thaw Resistance*, www.cement.org/Learn/concrete-technology/durability/freeze-thaw-resistance.

⁴ [Associated General Contractors of America](http://AssociatedGeneralContractors.org)

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