

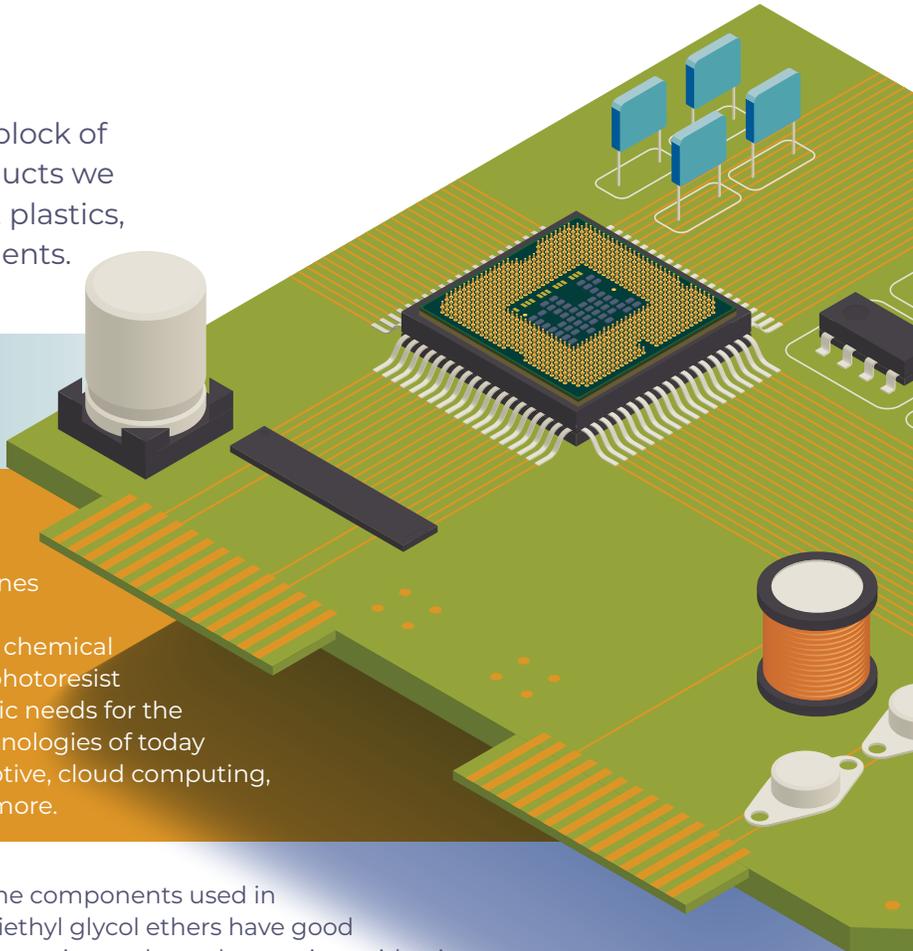
ETHYLENE OXIDE



Necessary For The Production of Semiconductors

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

One area where ethylene oxide is used is in semiconductors



How is it used?

A major role of ethylene oxide is in the production of a wide variety of solvents, amines and surfactants used in semiconductor chip manufacturing processes like wafer cutting, chemical mechanical planarization, photoresist, and photoresist residue cleaner. Each product targets specific needs for the semiconductor industry – crucial to the technologies of today and tomorrow, including aerospace, automotive, cloud computing, medical devices, telecommunications, and more.

- ✓ Ethylene oxide-based glycol ether solvents are the components used in photoresist and photoresist stripper products. Diethyl glycol ethers have good compatibility, high solubility, and easy rinsing properties to clean photoresist residue in semiconductor manufacturing processes. Some glycol ethers can also be used as an ingredient in photoresist, a light-sensitive material to form a patterned coating on silicon wafer. Ethanolamines and alkanolamines are ethylene oxide derivatives that work as ingredients in photoresist residue cleaners.
- ✓ Some special ethylene oxide-based surfactants are the ingredients in chemical mechanical planarization, a process of smoothing wafer surfaces with the combination of chemical and mechanical forces. The surfactants are also the ingredients in silicon wafer cutting fluid, a type of coolant and lubricant designed specifically to prevent silicon swarf agglomeration, allowing for easier cutting and burr reduction.
- ✓ High purity and low metal ion are the normal quality requirements for the semiconductor industry.
- ✓ EO derivatives are needed for production of the semiconductor industry, which is one of America's top import industries and will be a key driver of America's economic strength, national security, supply chain resiliency, and global competitiveness. The CHIPS Act was enacted in 2020 to strengthen the semiconductor industry in the United States with over \$210 billion in new private investments announced across 19 states supporting over 50 new semiconductor ecosystem projects and 44,000 new high-quality jobs.¹

¹ Semiconductor Industry Association

