

Which gloves can be used to protect against Ethylene Oxide (EO) and Propylene Oxide (PO)?

We regularly receive questions on chemical recommendations or breakthrough times for our gloves versus these two specific chemicals. Ethylene oxide and propylene oxide are epoxides, which means they have a ring with two carbon atoms and an oxygen atom in their structure.

Properties

Ethylene Oxide (synonyms: EO, oxirane) (CAS 75-21-8) is a colorless, flammable gas, and the simplest epoxide existing. It is used in the production of ethylene glycol, and for medical sterilization. Because of its low boiling point (11°C), it is often handled and shipped as a refrigerated liquid. When exposed to room temperature, it evaporates rapidly, potentially causing frost bites.

Propylene Oxide (synonyms: PO, 1,2-epoxypropane) (CAS 75-56-9) is a colorless, volatile liquid; mainly used in the production of polyurethane plastics. The boiling point is around 34°C, so it's normally handled in liquid state.

Hand protection

Ethylene oxide and Propylene oxide, GAS

When handling gaseous EO or PO, a glove as a standalone protective equipment will not provide sufficient protection. In this case, a fully encapsulating suit will have to be worn and combined with gloves from the following materials: nitrile or neoprene.

Barrier® is expected to show good results, but should be combined with an appropriate overglove: TouchNTuff® 92-600, Microflex® 93-853, Solvex® 37-186, or Scorpio® 09-022/19-024 for cold insulation.

Ethylene oxide, LIQUID

Barrier® gloves are also expected to show good results and should be tried out with an appropriate overglove, depending on the usage.

- For lab applications, wear TouchNTuff® 92-600 or Microflex® 93-853 over the Barrier®. Underneath, insulative liners could be added for cold insulation.
- For more mechanical protection, combine Barrier® with Solvex® or even NitraSafe® as cut protection.

Propylene oxide, LIQUID

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- For lab applications, wear TouchNTuff® 92-600 or Microflex® 93-853 over the Barrier®. Underneath, insulative liners could be added for cold insulation.
- For more mechanical protection, combine Barrier® with Solvex® or even NitraSafe® as cut protection. PVA® gloves could be used as well: breakthrough is expected after about 30 min. ChemTek™ 38-520 butyl rubber gloves will also only provide limited protection.

Recommendations made in this note are based on extrapolations from laboratory test results and information regarding the composition of chemicals and may not adequately represent specific conditions of end use. Synergistic effects of mixing chemicals have not been accounted for. For these reasons, and because Ansell has no detailed knowledge of or control over the conditions of end use, any recommendation must be advisory only and Ansell fully disclaims any liability including warranties related to any statement contained herein.