

THE FACTS ETHYLENE OXIDE



About 46,900 workers in the EU are estimated to be potentially exposed to ethylene oxide. The primary routes of potential human exposure to ethylene oxide are inhalation and ingestion. It is a carcinogen (classified as group 1 by IARC) that may cause leukemia, lymphoid and breast cancers. It is also linked to spontaneous abortion, genetic damage, nerve damage, peripheral paralysis, muscle weakness, as well as impaired thinking and memory. In liquid form, it can cause severe skin irritation upon prolonged or confined contact.

Where risks occur

There is a high risk of exposure to ethylene oxide to the workers working in medical services, printing industry, industrial chemical, rubber and plastic manufacturing.

More about the substance

Ethylene oxide is a flammable, colorless gas at temperatures above 10.7 °C that smells like ether at toxic levels. It is found in the production of solvents, antifreeze, textiles, detergents, adhesives, polyurethane foam, and pharmaceuticals. The major use of ethylene oxide is as a chemical intermediate in the manufacture of ethylene glycol. Its smaller amounts are present in fumigants, sterilants for spices and cosmetics, as well as during hospital sterilization of surgical equipment.

How symptoms can affect you

Acute effects and early symptoms of exposure to ethylene oxide may cause eye pain, sore throat, difficult breathing, blurred vision, dizziness, nausea, headache, convulsions, blisters, vomiting, coughing, increased miscarriages in female workers, testicular degeneration and sperm concentration. Prolonged exposure may cause leukemia, lymphoid or breast cancer.

Latency period between exposure and ethylene oxide related cancer varies from 9 to 20 years.

What you can do

Perform proper exposure measurements continuously so it is known when actions should be taken. Investigate if workers report early symptoms. Workers need to be aware of the effects of exposure.

Best solution is to control exposure, for example by avoiding inhalation and dermal contact. Use stringent control measures such as process enclosure to prevent product release into the workplace. Install non-sparking ventilation systems and provide eyewash and safety shower if contact or splash hazard exists. To protect on the individual level, workers should wear goggles and proper protective clothing to protect the skin at all times in areas where there is a risk of splashes from liquid ethylene oxide. All clothing that has been degraded by ethylene oxide should be discarded. The workers should not eat, drink, or smoke while working with ethylene oxide. Personal protective equipment should only be used as a last resort, after introducing the possible engineering solutions.

References: OSHA, IARC, CDC, EPA, NIOSH, EC