

Ethylene glycol, diethylene glycol, 1,4-butanediol and the nitrated derivatives of the glycols and of glycerol

Definition of causal agent

Glycols are aliphatic hydrocarbons which possess two hydroxyl groups.

Ethylene glycol (HOCH₂-CH₂-OH) or ethanediol, diethylene glycol (HOCH₂-CH₂) and 1,4 butanediol (OH(CH₂)₄OH) are liquids with a fairly low vapour pressure.

Main occupational uses and sources of exposure:

Ethylene glycol and diethylene glycol are widely used in industry and have various applications. Ethylene glycol is often used in antifreeze or liquid coolants, while diethyleneglycol is often used for de-icing, in brake fluids, lubricants, mould-release agents and inks, as a textile softening agent, plasticizer. Glycols are used as an intermediate in chemical synthesis of some plastics and polyester fibres.

1,4 butanediol is used industrially as a solvent. Some butanediols are used in cosmetics.

Local toxic effects

□ Irritant effects

These substances may cause slight irritation of the skin and mucous membranes.

Exposure criteria:

Minimum intensity of exposure: Occupational exposure confirmed, if possible assessed by history and study of exposure conditions providing evidence of skin contact or inhalation.

Minimum duration of exposure: irritation of mucous membranes: seconds to minutes

Irritant dermatitis: several days

Maximum latent period: irritation of mucous membranes: The first manifestations should appear during exposure

Irritant dermatitis: The first manifestations should appear during exposure or within 48 hours at the latest

See section on *Occupationally caused irritation of the skin and mucous membranes* in Annex I entry nr. 202.

□ Systemic effects

For ethylene glycol and diethylene glycol acute systemic toxicity has only been described after ingestion. Ingestion of 1 mg/kg body weight can lead to severe intoxication starting with central nervous depression, followed by metabolic acidosis and ultimately renal failure.

Under normal working conditions these glycols are unlikely to cause harmful effects. They have a low vapour pressure at room temperature. There is therefore a risk for inhalation only at high temperature or where aerosols are formed. The level of absorption through the skin is low.