



Ethylene glycol

General Information

Key Points

- ethylene glycol is a clear, colourless liquid with a syrup-like consistency
- it is commonly used in antifreeze solutions, de-icers and as an engine coolant
- the general public are most likely to be exposed to ethylene glycol by dermal contact during use of ethylene glycol containing products such as antifreeze
- exposure may occur in workplaces which handle or use ethylene glycol although safe limits are enforced to protect the employees
- inhaling or getting small amounts of ethylene glycol on the skin is not likely to pose a risk to health
- ethylene glycol may cause irritation to the eyes
- drinking ethylene glycol or products that contain it can cause “drunkenness” like symptoms, lung, heart and kidney damage, coma and potentially death

Public Health Questions

What is ethylene glycol?

Ethylene Glycol is clear, colourless liquid with a syrup-like consistency. Ethylene glycol may also be called ethane 1,2-diol, mono ethyl glycol or MEG.

What is ethylene glycol used for?

Ethylene glycol has good solvent properties and is used widely in paints, lacquers, dyes and inks. A number of chemicals are made using ethylene glycol; primarily polyester fibres and polyethylene terephthalate (a plasticiser). Because it is both a solvent and has a low freezing point it is widely used in antifreeze solutions, de-icers and as an engine coolant. Antifreeze solutions for cars may have an ethylene glycol content of 60 to 100%, while windscreen wash may contain up to 30% ethylene glycol.

Ethylene glycol is “hygroscopic” i.e. it absorbs water from the atmosphere. This property is exploited in some cosmetics, food and pharmaceuticals, where small amounts are added to retain moisture. Ethylene glycol is also used to remove moisture from natural gas during its processing.

How does ethylene glycol get into the environment?

Ethylene glycol may enter the environment from industrial sources, such as factory effluent or from products containing it such as de-icer. It is not a persistent chemical, and is broken down in the environment (usually within a few weeks).

How might I be exposed to ethylene glycol?

Exposure may occur in the workplace although safe limits are enforced to protect employees. Such levels are below those that are thought to cause harmful effects.

The general public are most likely to be exposed to ethylene glycol by dermal contact during use of ethylene glycol containing products (e.g. anti-freeze). There have been many reported cases of children consuming antifreeze, often mistaking it for a soft drink. Exposure is likely to be minimal if the products are used appropriately.

If I am exposed to ethylene glycol how might it affect my health?

The presence of ethylene glycol in the environment does not always lead to exposure. In order for it to cause any adverse health effects you must come into contact with it. You may be exposed to ethylene glycol by ingesting it or by skin or eye contact with it. Following exposure to any chemical, the adverse health effects you may encounter depend on several factors, including the amount to which you are exposed (dose), the way you are exposed, the duration of exposure, the form of the chemical and if you were exposed to any other chemicals.

Small spills of ethylene glycol on the skin are unlikely to cause harm provided they are washed off immediately. Ethylene glycol is an irritant and splashing it in the eyes could cause stinging, though this should not lead to permanent damage. Following ingestion of large amounts, symptoms may appear like “drunkenness”, after this serious damage to the heart, lungs and kidneys may arise and can lead to coma, nerve damage and death. Inhalation of ethylene glycol is not considered to be a serious risk to health. It is unlikely that environmental contamination will result in any adverse health effects.

Can ethylene glycol cause cancer?

Ethylene glycol is not considered to cause cancer.

Does ethylene glycol affect pregnancy or the unborn child?

There are limited data available on the effects of exposure to ethylene glycol on pregnancy and the unborn child. Effects on the unborn child are more likely to occur at levels that harm the mother.

How might ethylene glycol affect children?

Ethylene glycol may affect children in the same way as adults. Ethylene glycol containing products such as antifreeze and screen wash which are stored in appropriated containers and kept out of the reach of children.

What should I do if I am exposed to ethylene glycol?

You should remove yourself from the source of exposure.

If you have inhaled or ingested ethylene glycol seek medical advice.

If you have got ethylene glycol on your skin, remove soiled clothing, wash the affected area with lukewarm water and soap for at least 10 – 15 minutes and seek medical advice.

If you have got ethylene glycol in your eyes, remove contact lenses, irrigate the affected eye with lukewarm water for at least 10 – 15 minutes and seek medical advice.

Additional sources of information

NHS Choices – Poisoning: <http://www.nhs.uk/Conditions/Poisoning/Pages/Introduction.aspx>

UKTIS. Best Use of Medicines in Pregnancy <http://www.medicinesinpregnancy.org/>

This information contained in this document from the PHE Centre for Radiation, Chemical and Environmental Hazards is correct at the time of its publication.

First published: October 2016

For queries relating to this document, please contact: generaltox@phe.gov.uk

© Crown copyright 2016, www.gov.uk/phe

Re-use of Crown copyright material (excluding logos) is allowed under the terms of the Open Government Licence, visit www.nationalarchives.gov.uk/doc/open-government-licence/version/3/ for terms and conditions.