



Vinyl Chloride

General Information

Key Points

- vinyl chloride is a colourless, flammable gas
- majority of vinyl chloride is used in the manufacture of PVC
- it is a chemical intermediate and so risk of exposure to the general public is low
- exposure to vapours can cause coughing, wheezing and breathlessness, headache and drowsiness
- contact of the skin or eyes could cause irritation and dermatitis
- exposure to escaping gas from compressed (liquid) vinyl chloride may cause frostbite
- repeated exposure to vinyl chloride may cause liver damage
- vinyl chloride is known to cause cancer in humans

Public Health Questions

What is vinyl chloride?

Vinyl chloride is a colourless, flammable gas, which has a slightly sweet odour.

What is vinyl chloride used for?

Approximately 95% of the world's vinyl chloride production is used for the production of polyvinyl chloride (PVC), which is used in a variety of plastic products, including pipes, wire and cable coatings, and packaging materials.

It is also used in the production of chlorinated solvents, primarily 1,1,1-trichloroethane. Vinyl chloride was previously used as a refrigerant and as a propellant in aerosol sprays for a variety of products, such as pesticides, drugs and cosmetics. These uses have been banned in many countries.

How does vinyl chloride get into the environment?

It is not known to occur naturally and is only used as an industrial intermediate under strictly controlled conditions, with minimal exposure of workers or to the environment. It has been found at very low levels in landfill gas due to it being the breakdown product of various chlorinated hydrocarbons and in ground water. Vinyl chloride is also present in cigarette smoke.

Liquid vinyl chloride evaporates easily in air, and in water and soil evaporates rapidly if it is near the surface. In the air it breaks down in a few days to other substances, which may be harmful. Small amounts of vinyl chloride can dissolve in water.

How might I be exposed to vinyl chloride?

The general public may be exposed to vinyl chloride by breathing in tobacco smoke.

Vinyl chloride is only used as a chemical intermediate and in the past there was significant occupational exposure but now it is only used in closed systems with minimal exposure of the workers.

If I am exposed to vinyl chloride how might it affect my health?

The presence of vinyl chloride 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 by breathing the substance or by skin contact. Following exposure to any chemical, the adverse health effects that 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.

Exposure to vapours can cause weakness, effects on balance, headache, fatigue, numbness, tingling sensation, nausea, vomiting, stomach pain and sight and hearing disturbances, coughing, wheezing and breathlessness, headache and drowsiness. Skin or eye contact with liquid vinyl chloride can cause skin irritation, pains, burns and frostbite injury. Repeated exposure to vinyl chloride may cause liver damage.

Can vinyl chloride cause cancer?

The International Agency for Research on Cancer (IARC) concluded there is sufficient evidence in human studies that vinyl chloride can cause cancer. They have therefore classified vinyl chloride as a cancer causing chemical in humans.

Does vinyl chloride affect pregnancy or the unborn child?

Available evidence does not indicate that exposure to vinyl chloride during pregnancy will have a direct effect on the unborn child. However, if the exposure to vinyl chloride causes the mother to become unwell this may affect the health of the unborn child.

How might vinyl chloride affect children?

Children exposed to vinyl chloride are expected to show similar adverse health effects to those seen in exposed adults

What should I do if I am exposed to vinyl chloride?

It is very unlikely that the general population will be exposed to a level of vinyl chloride high enough to cause adverse health effects. However, if you have any health concerns regarding exposure to vinyl chloride seek guidance from your GP or contact NHS 111.

Additional sources of information

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

NHS Choices- Frostbite: <http://www.nhs.uk/Conditions/Frostbite/Pages/Introduction.aspx>

NHS Choices- Burns and scalds [http:// www.nhs.uk/Conditions/Burns-and-scalds/Pages/Introduction.aspx](http://www.nhs.uk/Conditions/Burns-and-scalds/Pages/Introduction.aspx)

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

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

For all other enquiries, please contact: phe.enquiries@phe.gov.uk

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