

Formaldehyde

Almost everyone, at home, work or in the community is exposed to formaldehyde. It is a colourless gas with a strong and pungent odour which is known to cause skin, eye and respiratory damage, and which, in sufficient doses, affects the heart and lung function and the menstrual cycle. It causes allergic reactions and mental disturbances and is a known cause of several types of cancer.

Hazards

Even very short term exposure to formaldehyde irritates the eyes causing pain, redness, blurred vision and severe eye watering.

It can irritate the nose and throat causing sneezing, soreness, coughing, shortness of breath, headaches and nausea. In severe cases of exposure to elevated levels it can lead to accumulation of fluid in the lung (pulmonary oedema).

Long term exposure causes chronically impaired lung function, skin hardening, swelling and flaking, dermatitis, allergic eczema, and cancer.

Formaldehyde is a skin and respiratory sensitiser. It is a sensitising agent which can stimulate the body's immune response so that a subsequent exposure to even a very small amount is likely to trigger an allergic response.

Despite this evidence, in 1986 the UK Industrial Injuries Advisory Council rejected designation of formaldehyde as a cause of occupational asthma prescribed for disablement benefit.

Formaldehyde has also been shown to cause sleep disturbance, impaired memory, reduced concentration, nausea and menstrual irregularity.

A known cause of cancer

The International Agency for Research on Cancer, (IARC) which is part of the World Health Organisation, has designated formaldehyde as a known cause of several types of throat and nasal cancer.

Exposure levels

In the UK formaldehyde has been assigned a Maximum Exposure Limit (MEL) of 2 parts per million (ppm).

Exposure to any substance for which a MEL has been set must be kept below that limit.

The MEL for formaldehyde is hard to explain in the light of HSE's own toxicology review which found that eye irritation can be caused by exposure to levels as low as 0.01ppm, 200 times less than the MEL.

Compare the UK exposure limit with the limit set in the USA where OSHA has set a permissible exposure level of 0.75ppm. In Sweden and Germany the maximum permissible indoor level is 0.1ppm. The UK control limits fail to take account of the fact that skin irritation can occur at levels well below the MEL and that many people will experience 'double exposure' by coming into contact with formaldehyde both at work and at home.

They also ignore the fact that home exposure affects the more vulnerable, such as the very young or elderly, pregnant women or people with existing skin or respiratory ailments.

It is planned that from December 2004 in the UK, Maximum Exposure Limits (MELs) and Occupational Exposure Standards (OESs) will be replaced by a system of Workplace Exposure Limits (WEL).

Exposure at Work

Formaldehyde is used in hundreds of industrial processes including the manufacture of paints, plastic products, paper, textiles, carpets, pesticides and fumigants, particle boards, MDF, chipboard and plywood, cosmetics, thermal insulation foams, furniture, biomedical products, leather goods, adhesives, glues and resins. Anyone involved in the manufacture or use of any of these products may be exposed to formaldehyde.

Less hazardous products are now available. 'Low gas' or 'zero gas' particle boards, chipboard and MDF products and low emission adhesives, glues and resins which emit much lower levels of formaldehyde have been developed. Safety representatives and workers in industries using these products should demand the safer materials.

Some local Construction Safety Campaign groups have succeeded in banning the use of fire retardant paints containing formaldehyde.

Exposure at Home

The main sources of exposure to formaldehyde in the home are furniture, which may contain formaldehyde in the glues, resins and board materials used in its manufacture, and urea formaldehyde foam products used in upholstery. Formaldehyde based resins are also used as a binding agent for mineral fibre based insulation products used for cavity wall and loft insulation and gap filling foams. HSE have published guidelines on work with urea formaldehyde. Formaldehyde vapour can be emitted for several years after installation. Additional exposure may come from formaldehyde-containing cosmetics and cleaning agents. Some carpets and soft furnishing textiles and wall coverings also contain formaldehyde based adhesives, finishes

and preservatives which can also raise domestic exposure levels.

Exposure from Environmental Pollution

Any process involving formaldehyde, for example in the manufacture of particle boards, can lead to the emission of fumes into the environment. There are several chipboard factories in the UK producing up to 1.5 million tons per year. These plants operate on a 24 hour basis 7 days a week. German law limits formaldehyde emissions to 0.03 milligrams per cubic meter of air vented to the atmosphere. Standards in the UK are much lower and tests have shown that emissions from the UK factory of one German based company are almost double the levels permitted by the German standard. Formaldehyde has also been discharged into rivers and water courses killing thousands of fish and polluting water supplies.

Action Points

Risk assessments and control measures for all processes and products where formaldehyde is used must meet the

minimum requirements of the Control Of Substances Hazardous to Health (COSHH) Regulations. Protection should follow the COSHH hierarchy of controls.

Formaldehyde is a relatively cheap material used in a wide range of processes and products but safer substitutes are available. Aim to introduce a safer alternative at work and do not purchase formaldehyde-containing consumer products for home use.

All work processes should be enclosed or provided with adequate extraction and ventilation. Waste materials should not be vented to the atmosphere. Where exposure above the maximum permissible level is likely, personal protective equipment (PPE) and respiratory protective equipment (RPE) must be provided to anyone working with or near formaldehyde. Respiratory protective equipment should only be used for brief periods and must not be used as a permanent substitute for adequate extraction or ventilation.

Regular air testing to determine concentrations of formaldehyde should be carried out every 15 minutes over a full working day/shift to determine

levels and ensure that maximum levels are not exceeded.

Negotiate for the adoption of exposure levels below the Swedish indoor standard of 0.1ppm.

Negotiate for the use of 'low gas' or 'zero gas' particle boards, chipboard and MDF, and for the use of low emission adhesives, glues and resins.

Medical examinations of people working with formaldehyde should be carried out at least annually and more frequently when an exposure to concentrations greater than 2ppm has occurred. Tests for lung function are essential.

Fully equipped safety showers with emergency eye baths must be made available. Training must be given in hygiene and in dealing with spills and other emergencies.

To reduce exposure where urea formaldehyde foam has been used:

- ▲ Increase ventilation.
- ▲ Remove excess foam but avoid skin contact.
- ▲ Seal gaps where foam has been applied using a suitable material such as sand and cement mortar.

Factsheets online www.lhc.org.uk London advice 020 7794 5999



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