1,2-Dichloroethane

Dutch Expert Committee on Occupational Safety (DECOS)
A committee of the Health Council of the Netherlands

No. 2019/16, The Hague, August 27, 2019

Executive summary

Health Council of the Netherlands

At the request of the Ministry of Social Affairs and Employment, the Health Council of the Netherlands has derived health-based recommended values for 1,2-dichloroethane. This advisory report has been composed by the Dutch Expert Committee on Occupational Safety (DECOS). More information on the tasks of this permanent committee of the Health Council of the Netherlands can be found at www.healthcouncil.nl. The members of the Committee are listed at the end of this report.

Use of 1,2-dichloroethane

1,2-Dichloroethane is primarily being used in the production of vinyl chloride, the monomer unit of polyvinyl chloride (PVC). The substance is classified as a category 1B carcinogen (*presumed to have carcinogenic potential for humans*). As recommended by the Subcommittee on Classification Carcinogenic Substances, the Committee considers 1,2-dichloroethane as a stochastic genotoxic carcinogen.

Recommended values based on extra risk of cancer

For carcinogenic substances that have been classified in category 1A or 1B and directly interact with DNA (stochastic genotoxic mechanism), no exposure level can be derived below which no carcinogenic effects can occur. To be able to set occupational exposure limits for these substances, the Minister of Social Affairs and Employment has determined risk levels. These risk levels relate to the extra risk of cancer due to occupational exposure. The target risk level is 4 extra cancer cases per 100,000 deaths in the general population; the prohibitive risk level is 4 per 1,000. The Committee estimates the concentration of a substance in the air that corresponds to these risk levels, taking into account 40 years of occupational exposure.

Consulted research

There are no studies available on exposure to 1,2-dichloroethane and cancer in humans that are suitable for deriving health-based recommended values. Several animal carcinogenicity studies have been performed with 1,2-dichloroethane. The Committee has evaluated these studies and selected the most appropriate study. In this study, mice that were chronically exposed to 1,2-dichloroethane by inhalation developed different types of tumours. The number of malignant mammary tumours was used to derive health-based recommended values.

Recommendation to the State Secretary

The Committee estimates the concentration of 1,2-dichloroethane in the air that corresponds to an extra cancer risk of 4 per 100,000 (the target risk level) equal to 0.126 milligram (mg)/per cubic metre air (m^3). An extra risk of cancer of 4 per 1,000 (the prohibitive risk level) corresponds to a concentration of 12.6 mg/m^3. Both estimates are based on 40 years of occupational exposure.

In addition, the Committee recommends to apply a skin notation for 1,2-dichloroethane because the substance is absorbed by the skin relatively well, and can thereby contribute substantially to the total internal exposure.

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