

# Tin and selected inorganic tin compounds

Evaluation of the effects on reproduction, recommendation for classification

No. 2022/27, The Hague, November 8, 2022

## Executive summary

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Health Council of the Netherlands



At the request of the Minister of Social Affairs and Employment, the Health Council of the Netherlands evaluated the effects of tin and selected inorganic tin compounds on reproduction. This advisory report was drafted by the Subcommittee on the Classification of Reproduction Toxic Substances of the Dutch Expert Committee on Occupational Safety (DECOS) of the Health Council, hereafter called the Committee. The Health Council has a permanent task in assessing the hazard of substances to which man can be occupationally exposed. More information about this task can be found at [www.gezondheidsraad.nl](http://www.gezondheidsraad.nl).

### **Use of tin and inorganic tin compounds**

An important property of tin is the ability to form alloys with other metals. As such, tin is frequently used for electrical/electronic and general industrial applications. Tin also finds extensive use as a protective coating for other metals, especially for food containers.

Various tin compounds exist. The committee has evaluated tin and the following inorganic tin compounds: tin sulphide, tin oxide, ditin pyrophosphate, tin dichloride, tin difluoride, tin sulphate, tin difluoroborate, tin disulphide and tin dioxide. Tin dichloride is commercially the most important inorganic compound and is mainly used as a reducing agent in organic and inorganic syntheses and in the manufacture of metallized glazing, glass, and pigments. Tin difluoride is broadly used in preventive dentistry.

Workers may be exposed to inorganic tin substances via air (dust and fumes) during bagging, smelting operations and cleaning.

### **Classification based on evidence**

To assess effects on reproduction, the Committee evaluates the effects on male and female fertility and on the development of the offspring. Moreover, the Committee considers effects of a substance on lactation and on the offspring via lactation. If the data indicate

hazardous properties, the Committee recommends classification in a hazard category. The classification is performed according to EU-regulation (EC) 1272/2008.

### **Research consulted**

Only a few epidemiological studies are available both regarding effects of exposure to tin on fertility. Several studies are available on developmental effects. However, in both cases studies indicate no, or no clear association with exposure to tin. Also, animal studies have been performed with tin and some selected inorganic tin compounds, on effects on fertility as well as on effects on development. These studies do not show clear adverse effects, however, the data available are insufficient to draw conclusions.

For effects of exposure to tin on or via lactation, the evaluation is based on research with humans. The Committee considers it unlikely that the concentrations of tin in breastmilk that have been measured in those studies will result



in adverse effects for the infant after breastfeeding.

### **Recommendations to the Minister**

Based on the scientific data available, the Committee recommends to not classify tin, and all evaluated inorganic tin compounds for effects on fertility, for effects on offspring development and for effects on or via lactation.

The Committee recommends:

- for effects on fertility: not to classify due to a lack of appropriate data;
- for effects on development: not to classify due to a lack of appropriate data;
- for effects during lactation: not to classify.



The Health Council of the Netherlands, established in 1902, is an independent scientific advisory body. Its remit is “to advise the government and Parliament on the current level of knowledge with respect to public health issues and health (services) research...” (Section 22, Health Act).

The Health Council receives most requests for advice from the Ministers of Health, Welfare and Sport, Infrastructure and Water Management, Social Affairs and Employment, and Agriculture, Nature and Food Quality. The Council can publish advisory reports on its own initiative. It usually does this in order to ask attention for developments or trends that are thought to be relevant to government policy.

Most Health Council reports are prepared by multidisciplinary committees of Dutch or, sometimes, foreign experts, appointed in a personal capacity. The reports are available to the public.

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Preferred citation:

Health Council of the Netherlands. Tin and selected inorganic tin compounds.

The Hague: Health Council of the Netherlands, 2022; publication no. 2022/27.

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