

# Mercury from dental amalgam

## What are the environmental risks and indirect health effects of mercury from dental amalgam?



Dental amalgam, an alloy of mercury and silver, has been in use for over 150 years for the treatment of dental cavities, due to its excellent mechanical properties and durability.

Dental amalgam represents the second largest use of mercury in the EU, after its use in the chlor-alkali industry. The use of alternative materials such as composite resins, glass ionomer cements, ceramics and gold alloys is increasing, either due to their aesthetic properties or to alleged health concerns in relation to the use of dental amalgam.

### → HOW MUCH MERCURY IS RELEASED INTO THE ENVIRONMENT THROUGH ITS USE IN DENTAL AMALGAMS ?

Emissions from the use of mercury in dental amalgam fillings can occur during the preparation of the amalgams and their subsequent removal and disposal. They can also occur when human remains that have amalgam fillings are cremated or buried. In Europe, the total amount of mercury released into the air by human sources is estimated to have been around 142 tons per year in 2010. Natural emissions, such as those from volcanic activity or forest fires, are estimated to be at around 87 tons per year for the same period. By comparison, releases in the air from dental practices are estimated to be at around 19 tons per year.

### → ARE MERCURY RELEASES CAUSED BY THE USE OF DENTAL AMALGAM A RISK TO THE ENVIRONMENT ?

At present there is still not enough information

available to make a comprehensive risk assessment for the environment; however some general conclusions can be reached. For the aquatic environment, in general, mercury from amalgam does not represent a risk for European surface waters. However, under exceptional local conditions (maximal dentist density, maximal mercury use, absence of separator devices), it could be that the amount of mercury would be higher than the environmental quality standards. In such cases, a risk for the aquatic ecosystem could not be excluded. For soil and air, there are still not enough data available to make an assessment of the risk.

### → IS THE AMOUNT OF MERCURY PRESENT IN THE ENVIRONMENT A POSSIBLE HEALTH RISK FOR HUMANS ?

Mercury coming from dental amalgam as well as from many other sources present in the global environment can be taken up by the general human population via food, water and air. However, mercury present in the environment from amalgams is only a very minor fraction of the total amount of mercury that people are exposed to. In the aquatic environment, under particular local conditions where the concentration of mercury in the aquatic environment is higher than the environmental quality standards, a risk of secondary poisoning in humans through food cannot be excluded. Indeed, some mercury can be transformed into methyl mercury, which can accumulate in organisms along the food chain. This, in turn, can cause health problems in humans if there is more mercury than the safe level, mainly through the consumption of fish. However, this risk is minimized by the EU food legislation excluding food commodities from the market exceeding the maximum allowed concentration of mercury and other metals.

### → ARE THE ALTERNATIVE MATERIALS FOR DENTAL FILLINGS SAFER THAN MERCURY AMALGAMS

In many reports it is concluded that the ecological risk of the available alternatives is very low, with low emissions and low intrinsic toxicity. However, available information does not enable a proper comparison assessment of amalgam alternatives. For the human health, SCHER is again of the opinion that the indirect risks to human health from the release of the amalgam alternatives without mercury is low, except for alternative materials containing bisphenol A-glycidyl methacrylate. For these materials SCHER recommends to refer to the SCENIHR opinion on the use of bisphenol A in medical devices. Ecotoxicological information on the effects of the products more frequently used for dental resins is practically absent and more research on those materials is needed to make a sound risk assessment. In addition, SCHER suggests that the chemical composition of alternative materials should be fully declared.

This fact sheet is based on the opinion of the independent Scientific Committee on Health and Environmental Risks (SCHER): "Opinion on the environmental risks and indirect health effects of mercury from dental amalgam (update 2014)".

The detailed and nuanced view of the European Scientific Committee on Health and Environmental Risks on this issue is available at:  
[http://ec.europa.eu/health/scientific\\_committees/environmental\\_risks/opinions/index\\_en.htm](http://ec.europa.eu/health/scientific_committees/environmental_risks/opinions/index_en.htm)