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# Dental amalgam and the Mercury Regulation

The regulation on mercury, implementing the Minamata Convention and addressing also dental amalgam should be seen in the light of the European Union strategy for a non-toxic environment, proposed in the 7EAP. Art.10 of the regulation addresses the release of mercury from dental amalgam in a very limited way.

EurEau advocates setting a date for a ban on the use of dental amalgam, since alternatives to dental amalgam exist and the ban has already been imposed in several Member States. By doing so, it will be possible to move to a true circular economy where sludge resulting from waste water treatment will meet the quality standards to be reused.

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## Introduction

In 2013 the European institutions adopted the 7<sup>th</sup> Environmental Action Programme (7EAP) establishing that “long-term actions with a view to reaching the objective of a non-toxic environment will be identified” by 2020.

In paragraph 54 of the 7EAP this will be achieved by developing, “by 2018 a Union strategy for a non-toxic environment that is conducive to innovation and the development of sustainable substitutes including non-chemical solutions, building on horizontal measures to be undertaken by 2015 to ensure: (1) the safety of manufactured nanomaterials and materials with similar properties; (2) the minimisation of exposure to endocrine disruptors; (3) appropriate regulatory approaches to address combination effects of chemicals and (4) the minimisation of exposure to chemicals in products, including, inter alia, imported products, with a view to promoting non-toxic material cycles and reducing indoor exposure to harmful substances”.

## Mercury and dental amalgam

The Minamata International Convention on mercury was signed in 2013 and foresees that “each Party shall take measures for the mercury-added products”. The measures to be taken on dental amalgam are listed in Annex A part 2 to the Convention and they take a holistic approach to dental amalgam.



## The European Commission's proposed regulation on mercury

In art.10 of the proposal of the mercury regulation ((COM)2016 39 final) the European Commission envisages very limited action on dental amalgam (while the Minamata convention foresees various actions in the annex A part 2), proposing:

- “1. From 1 January 2019 onwards dental amalgam shall only be used in an encapsulated form.
2. From 1 January 2019 onwards dental facilities shall be equipped with amalgam separators aimed at retaining and collecting amalgam particles. Those separators shall be maintained as required to ensure a high level of retention.
3. Capsules and amalgam separators complying with harmonised EN standards or with other national or international standards that ensure an equivalent level of quality and of level retention shall be presumed to satisfy the requirement set out under paragraphs 1 and 2.”

## EurEau advocates a **ban** on dental amalgam

EurEau consistently advocated for a ban on dental amalgam so that, in the future, the levels of mercury in sludge from waste water treatment will reduce and it will be possible to reuse the resultant high quality sludge as a source of nutrients in a true circular economy. Since the quality of sludge in most Member States is improving over time, the relative importance of mercury from dental amalgam is increasing, and is now a major source of mercury to many, if not most, wastewater treatment plants in the EU, the biggest source of mercury is represented by the leakage of dental amalgam from the daily erosion of teeth: this will continue if using amalgam for new fillings is not banned.

Mercury separators at dental care clinics will just take care of a smaller part of the leakage of mercury to the environment.

For a long term reduction the amalgam ban is needed.

## The costs associated with sludge handling

Today, mercury originating from daily erosion from amalgam fillings in teeth is about 50 % of the total mercury in the urban waste water of Stockholm and consequently also 50% of the total mercury content in the sludge of Stockholm and in the discharge of treated wastewater (reference Sörme Lindqvist Söderberg 2003).



Mercury from the daily erosion of amalgam in teeth is by far the single biggest source of mercury in the sludge in Sweden. The same trend can be expected in many other Member States.

EurEau's conclusion is that there is a need to further reduce mercury in urban waste water and that there is a strong need for restrictions on the use of dental amalgam. To ban mercury in amalgam will - in the long run - relieve the European waste water treatment plants, the receiving waters and biota of Europe, and the circulation of nutrients from many tonnes of mercury.

A reduction of mercury of 20% over 20 years to the European waste water treatment plants is possible if a ban of mercury is introduced. This would be an important step in improving European sludge quality and to meet the strict national requirements on mercury for sludge to be reused.

If the sludge does not fulfil the requirements for use in agriculture due to mercury, sludge can be incinerated, be disposed to landfill or used for other purposes (e.g. land reclamation).

If the restriction proposal on mercury is not decided, we can estimate that 20% less sludge will be used in agriculture and a part of this sludge will be incinerated. Incineration is much more costly than the routes to agriculture, landfill or land reclamation (which are roughly the same range of costs).

In 2010, 20% of European sludge was used in agriculture and was equivalent to 1.1million tons sludge DM (Dry Matter). An estimation can be done that 50% of these 1.1million tons will be incinerated instead of going to agriculture = 550 000 tonnes sludge DM. The extra cost for the mono-incineration or waste+sludge incineration of 550,000 tonnes sludge DM is approximately €75 per tonnes of sludge 25-45% DM. This is equivalent to €167-300 per ton of sludge DM. The average value for the cost is then €233 per ton of sludge DM.

The extra cost for the mono-incineration or waste+sludge incineration of 550000 tons of sludge DM will be approximately €128 million per year.

There will also be an additional CO<sub>2</sub> cost due to the use of fossil fuel to support the incineration of sludge in the mono-incineration. The environmental cost for discharging amalgam mercury via waste water treatment plants into receiving waters and its biota is not calculated.

It can be concluded that the extra cost for sludge treatment by the water service sector will be approximately €128 000 000 per year if the restriction proposal on mercury is not decided.

Using amalgam separators in dental practice will only partly solve the problem. 14 Member States have already adopted national legislation obliging dental practices to use separators (to capture mercury in the waste stream)



and overall around 25% of EU dental facilities are still not equipped with separators.

In the long term, new control mechanisms (such as an EU-wide phase-out of 'new' dental amalgam) are required to deal with this diffuse source. Swedish studies indicate that dental amalgam is the source of 85-90% of the mercury entering waste water treatment plants, making dental amalgam the single largest source of mercury to the receiving waters and to sewage sludge, **due to daily erosion of people's amalgam fillings and leakage from dental clinics and their sewers.**

A ban is crucial if our economies aim to become truly circular. In fact nutrients from WWTP's can be used in agriculture if they comply with strict quality standards and minimise the accumulation of mercury in the European soils.

In the Communication from the European Commission '*Closing the loop - An EU action plan for the Circular Economy*', the European Commission pointed out the importance of reducing pollutants in the circular economy recognising that "*another very important issue for the development of secondary raw materials markets is the link with legislation on chemicals. A growing number of chemical substances are identified as being of concern for health or the environment and become subject to restrictions or prohibitions. However, these substances may be present in products sold before the restrictions applied, some of which have a long lifetime, and therefore chemicals of concern can sometimes be found in recycling streams. Such substances can be costly to detect or remove, creating obstacles in particular for small recyclers*".

*In this context "the Commission will develop analysis and propose options on the interface between chemicals, products and waste legislation, including on how to reduce the presence and improve the tracking of chemicals of concern in products"*.

EurEau believes it is time to take long term action on the continuous flow of mercury from dental amalgam to WWTPs and further into the circular flow of nutrients by introducing now an end-date to the use of dental amalgam.

## The Water Framework Directive requirements

To reduce the inflow of mercury to WWTPs is also essential if the **mercury requirements of the Water Framework Directive and its daughter Directive on Priority Substances are to be achieved.** Since alternatives exist, a **phase-out of all new amalgam fillings**, already carried out with great success in several member states such as Denmark, Norway and Sweden, is also a cost-efficient method to reduce the flow of mercury to European waters.



It can also be regarded as best practice or best available technology to reduce the flow of mercury in urban areas.

## The Commission impact assessment

In the Commission's impact assessment, at p. 156, it is stated that "additional mercury releases to waste water occur as a result of amalgam deterioration due to chewing, ingestion of hot beverages and corrosion (mercury excreted by humans), **although quantities of mercury released from these deterioration processes are supposed to be smaller than those emitted by dental practices**".

This assumption does not reflect water operators' experiences.

In fact in countries such as Sweden, Norway and Denmark, where the use of dental amalgam was banned in dental clinics, water operators can see a decrease – but **not a significant decrease** - of the level of mercury in the waste water treatment plants. The background levels of mercury in the sludge due to daily erosion of dental amalgam can be a problem for the long time recycling of nutrients from WWTP to agricultural soils.

## The public consultation

In the same impact assessment at p. 46 it is recalled that the majority (85%!) of respondents in the public consultation favoured the ban, while only 12% expressed a preference for restricting the use of dental amalgam to its encapsulated form and impose the use of separators in dental practices. Only 3% of the participants did not respond to this question, indicating the strong interest this issue raised among participants.

Among individuals, 86% favoured the ban, against 11% favouring the separators option and 3% not responding. Among organisations, the corresponding figures are 61% in favour of the ban, 23% for the separators option and 16% for no response.

The same impact assessment highlights that "the issue of dental amalgam is the most controversial as **certain dentists are very much in favour of an immediate prohibition** while the Council of European Dentists (CED) rather support softer measures aiming at the gradual phase down of this use (separators and amalgam in encapsulated form).





## About EurEau

EurEau is the voice of Europe's water sector. We represent drinking and waste water service providers from 29 countries in Europe, from both the private and the public sectors.

Our members are the national associations of water services in Europe. At EurEau, we bring national water professionals together to agree European water industry positions regarding the management of water quality, resource efficiency and access to water for Europe's citizens and businesses. The EurEau secretariat is based in Brussels, from where we coordinate the work of around 200 experts from member organisations and utilities and advocate common positions with EU decision makers.

Our members are fully committed to the continuous supply of clean water and its safe return into the water cycle. We have a role in raising awareness of threats to the water environment. With a direct employment of around 500,000 people, the European water sector makes a significant contribution to the European economy.



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