

IMERC Fact Sheet

Mercury Use in Dental Amalgam

This Fact Sheet summarizes the use of mercury in dental amalgam, including the total amount of mercury amalgam sold in the U.S. in 2001, 2004, 2007, 2010, 2013, and 2016.

The information in the Fact Sheet is based on data submitted to the state members of the [Interstate Mercury Education and Reduction Clearinghouse \(IMERC\)](#), including Connecticut, Louisiana, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. The data is available online through the [IMERC Mercury-Added Products Database](#).

Mercury Use in Dental Amalgam

Dental amalgam, used in restorative work for filling teeth, is an alloy that contains silver, tin, copper, other metallic elements, and mercury, which typically makes up about 50 percent of the amalgam. Historically, dentists mixed amalgam on-site using bulk liquid mercury and metal powders, but today dental amalgam is purchased in pre-dosed amalgam capsules that come in different sizes. The mercury content of each capsule can vary from 100 to 1,000 milligrams of mercury.

Table 1 presents information on the total amount of mercury sold in dental amalgam in 2001, 2004, 2007, 2010, 2013, and 2016.¹ Five dental amalgam manufacturers have consistently submitted Mercury-added Product Notification Forms to IMERC-member states. These manufacturers are: Dentsply Caulk; DMG America / Goldsmith & Revere; Ivoclar Vivadent; Kerr Corp. / Sybron Dental Specialties; and SDI Limited. To date, IMERC has not received notification from other mercury amalgam manufacturers, although the Clearinghouse has reached out to additional parties it suspects of manufacturing/distributing in the U.S.

Table 1: Total Mercury Sold in Dental Amalgam (pounds)					
2001	2004	2007	2010	2013	2016
61,537 (30.77 tons)	53,213 (26.61 tons)	39,913 (19.96 tons)	34,163 (17.08 tons)	31,940 (15.97 tons)	22,074 (11.04 tons)

[Note: 453.6 grams = 1 pound; 2,000 pounds = 1 ton. All numbers are rounded to the nearest whole number.]

¹ More detailed information on the 2001 and 2004 data can be found in the report, *Trends in Mercury Use in Products: Summary of the IMERC Mercury-added Products Database*, June 2008.

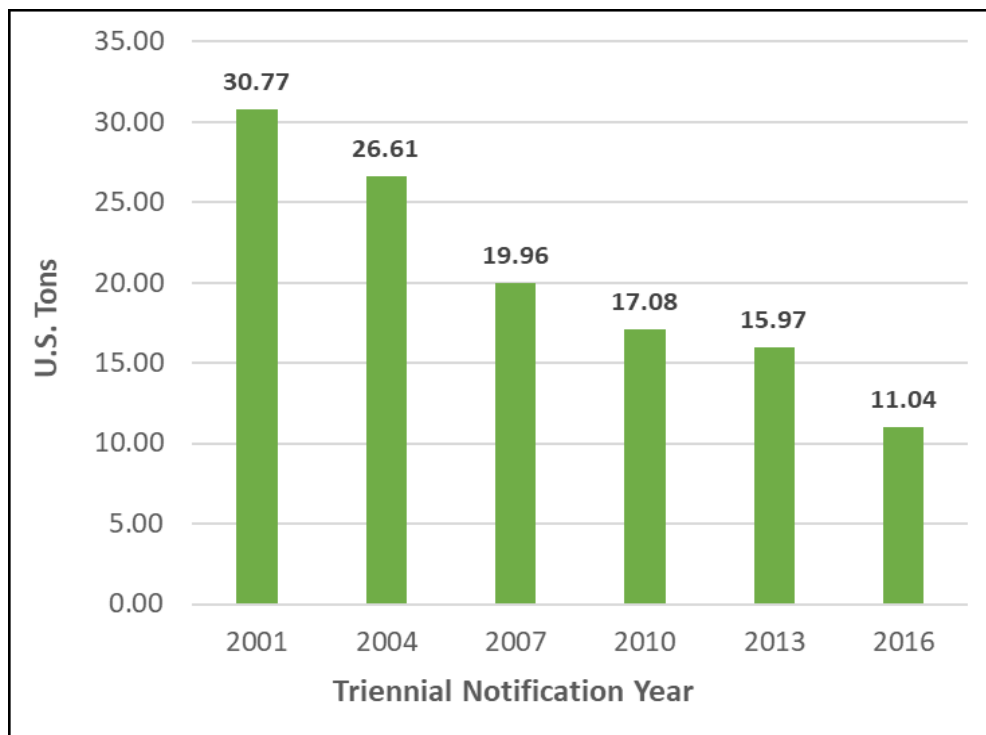
(www.newmoa.org/prevention/mercury/imerc/pubs/reports.cfm)

The 2007 data is taken from a NEWMOA presentation, *Trends in Mercury Use in Products: Analysis of the IMERC Mercury-added Products Database*, November 17, 2009.

(www.newmoa.org/prevention/mercury/conferences/sciandpolicy/presentations/Wienert_Session3B.pdf)

The 2004 and 2007 totals were updated in June 2010 based on revised data submitted to IMERC by one of the dental amalgam manufacturers and differ slightly from the totals noted in the reports referenced above. The 2007 total was updated again in August 2013 based on a correction from one manufacturer.

Reported use of mercury in dental amalgam sold in the U.S. in 2001 was approximately 30.77 tons, decreasing to 11.04 tons in 2016, or by about 64 percent. Increased consumer awareness of mercury use in fillings may drive future declines in mercury amalgam use; however, non-mercury fillings are more expensive, and many dental insurance plans fully cover only the cost of amalgam fillings, which can affect the preferences of patients for dental restorative materials.



Although its use has significantly decreased, dental amalgam remains one of the largest categories of mercury use in products for all of the IMERC reporting years. Unlike other mercury-added products, there are no state restrictions on the sale or distribution of dental amalgam.

In July 2009, the U.S. Food and Drug Administration (FDA) issued a [final rule](#) that classified dental amalgam as a class II (more risk) device and developed a guidance document that identified specific controls and practices for managing the handling and disposal/recycling of dental amalgam. The FDA did not recommend against its use, so many dentists continue to use mercury-added dental amalgam for some patients.

In June 2013, the U.S. ratified the [Minamata Convention on Mercury](#), an international treaty of the United Nations Environment Programme (UNEP) intended to protect human health and the environment from the adverse effects of mercury. While the Convention does not completely ban the use of mercury in dental amalgam, it requires a “phase-down” on the material and sets specific provisions for its use (see Part II: Products Subject to Article 4, Paragraph 3 – page 48).

As of May 2017, 128 countries have signed the Convention (including the U.S.), and 52 have ratified it.²

Disposal & Recycling

Over the past eight years, many states have introduced best management practices³ (BMPs) for dental amalgam waste so that dental offices capture and recycle this material. These BMPs include requirements for installing amalgam separators, properly managing solid waste with amalgam, and amalgam recycling. These practices can prevent mercury from dental amalgam entering wastewater, wastewater sludge, and solid waste and, therefore, help to reduce the discharges and environmental impacts of dental amalgam waste. The [American Dental Association \(ADA\)](#) has also published BMPs for managing and recycling amalgam waste.

In June 2017, the Environmental Protection Agency (EPA) [finalized a rule](#) under the Clean Water Act requiring dentists to install amalgam separators to help reduce discharges of dental amalgam to the environment. An amalgam separator is essentially a mercury collection device located in the vacuum lines of dental offices. They capture dental amalgam particles (and other solid materials) from the office wastewater before it reaches the sewer. EPA expects compliance with this rule will annually reduce the discharge of mercury by 5.1 tons as well as 5.3 tons of other metals found in waste dental amalgam to publicly-owned treatment works (POTWs).

Many states have been proactive in this area and have had regulations requiring the use of amalgam separators and/or recycling as well. In addition, since dental amalgam contains mercury, most states consider it a hazardous waste and, therefore, prohibit disposal in municipal solid waste or wastewater systems. Some states, including Maine, Minnesota, and New Hampshire require amalgam recycling as well.

Non-Mercury Alternatives

Non-mercury resin and composite materials are substitutes for mercury dental amalgam fillings. These include glass ionomer, gold foil, cast gold alloy, porcelain, and metal ceramic restorative fillings and crowns. These alternatives are usually more costly than traditional amalgam fillings, partly due to the limited coverage from many dental insurance companies.

Composite resins are tooth-colored, plastic materials (made of glass and resin) that are used both as fillings and to repair defects in the teeth. Composites are often used on the front teeth where a natural appearance is important, but they can be used on the back teeth as well depending on the location and extent of the tooth decay.

Metal alloys include gold, copper, and other metals. They are very strong, making them effective for use in crowns, fixed bridges, and partial dentures. However, because of their metal color (gold or silver), they do not have the appearance of normal teeth. For more information on the different types of dental fillings, visit: www.ada.org/public/topics/fillings.asp#restoring.

² UN Environment, Minamata Convention on Mercury:
<http://www.mercuryconvention.org/Countries/tabid/3428/language/en-US/Default.aspx>

³ Massachusetts Water Resource Authority, 2016:
<https://www.mass.gov/files/documents/2016/08/pt/best-practices-hg-waste.pdf>

Data Caveats

A number of important caveats must be considered when reviewing the data summarized in this Fact Sheet:

- The information may not represent the entire universe of mercury-added dental amalgam sold in the U.S. The IMERC-member states continuously receive new information from mercury-added product manufacturers, and as a result, the data presented in this Fact Sheet may underestimate the total amount of mercury sold in this product category.
- The Notification requirement only applies to manufacturers and distributors of mercury-added dental amalgam that are allowed to sell into one or more of the IMERC Notification States: Louisiana, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. (Note: Connecticut does not consider dental amalgam to be a “mercury-added product” under their regulatory definition).
- The information summarizes mercury use in dental amalgam sold nationwide since 2001. It does not include products sold prior to January 1, 2001 or exported outside of the U.S., or products sold in-between triennial reporting years.
- Reported data includes only mercury that is used in the product, and does not include mercury emitted during mining, manufacturing, or other points in the product’s life cycle.