

Mercury Rising? Analyzing Emissions and the Cremation Process 2008

By Paul Rahill

Consumers and businesses are adopting an ecological mindset more than ever before. The environment's well being permeates everything we do—from properly disposing of fast-food containers to driving hybrid cars. The environment (and the U.S. role in global pollution) is a key issue for many candidates running for office.

But the environmental focus for professionals in our industry is not stopping there. We continue to research the impact of our environmental footprint after life, specifically from the cremation process.

Our systems and technology yield great advances in the reduction of particulate matter (PM), visible emissions (VE) and carbon monoxide (CO) from the cremation process. PM and CO are the two most-commonly regulated pollutants from cremation equipment.

Now, however, the focus has turned to mercury emissions. The U.S. Environmental Protection Agency (EPA) describes mercury as a “naturally occurring element that can be found throughout the environment.” Although naturally occurring, different human activities can increase or decrease the amount of mercury moving among the atmosphere, bodies of water and soils.

According to the report, “U.S. EPA Best Point Estimates of 1994-1995 National Mercury Emission Rates by Category,” there are some human activities among the top culprits of recycling mercury into the environment:

- Municipal incinerators.
- Fluorescent tube lamps breaking and releasing their contents.



- Dental facilities.
- Batteries (production and disposal).
- Household trash disposal.
- Residential heating (oil).

The operation of crematories is one of the lowest sources cited.

The most notable way that mercury enters the cremation cycle, and therefore crematory emissions, is through silver amalgam dental fillings found in some dead human bodies.

Silver amalgam fillings contain mercury alloys that when introduced through dead humans into the cremation process of intense heat result in the volatilization of mercury and its emissions into the atmosphere.

Silver amalgam dental fillings containing mercury have been common for many years, but their use appears to be in significant decline. Within the last 10 years, the percentage of fillings containing mercury declined by 30 percent.

One British organization recently tested 54 cremations at two U.K. crematoria for mercury emissions. The Department for Environment, Food and Rural Affairs (DEFRA) and Scottish Environmental Protection Agency (SEPA) reviewed test protocols, procedures and



final results from this endeavor, All testing was conducted

under normal operating conditions for the cremation equipment. Both agencies accepted the test as being conducted in compliance with the British testing standards BSEN13211-2001.

Testing for mercury in crematoria emissions was also conducted in the United States by the U.S. EPA. The test protocols and procedures were submitted by Midwest Research Institute and were reviewed and approved by the U.S. EPA. Nine human cremations were tested at The Woodlawn Cemetery in the Bronx, N.Y. All testing was conducted under normal operating conditions for the cremation equipment.

Test results were submitted by EPA's contractor, Midwest Research, to the U.S. EPA and reviewed by its staff. EPA accepted the test as being conducted in compliance with testing standards. The data was published by the U.S. EPA as the established baseline for mercury emissions and posted them to the National Emissions Database as a reference for all interested parties.

Test Data Summary

U.K. TEST 1 (Craigton Crematorium/Pelican Scientific)

Here is an overview of the U.K. study:

- Conducted in October 2006.

- 23 cremations total.
- Normal operating conditions.
- 10 cremations suspected to have no silver amalgam fillings.
- Average mercury release per cremation over 23 cremations—.128 grams per body.
- Average mercury release per cremation for only the 13 cremations believed to contain silver amalgam fillings—.227 grams per body.

UK TEST 2 (Linn Crematorium/ Pelican Scientific)

The second test was almost a year later:

- Conducted in September 2007.
- 31 cremations total.
- Normal operating conditions.
- 21 cremations suspected to have no silver amalgam fillings.
- Average mercury release per cremation over 31 cremations—.323 grams per body.
- Average mercury release per cremation for only the 10 cremations believed to contain silver amalgam fillings—1.001 grams per body.

U.S. EPA TEST 1 (Woodlawn Crematorium/ Midwest Research Institute)

Compare the U.K. data with the first U.S. test:

- Conducted in June 1999.
- Nine cremations total.
- Normal operating conditions.
- Two cremations suspected to have no silver amalgam fillings.
- Average mercury release per cremation over nine cremations—.456 grams per body.
- Average mercury release per cremation for only the seven cremations believed to contain silver amalgam fillings—.584 grams per body.

The average mercury emissions from these documented tests, under a worst-case scenario, would be .568 grams of

mercury emitted per body cremated. It is very interesting to note that this average of .568 grams is almost identical to the U.S. EPA test average of .584 grams per body. The current information confirms that the mercury emissions information located in the U.S. EPA National Emissions database is accurate for determining the mercury emissions impact of cremation.

Mercury used in the dental profession is already significantly in decline. However, we should continue to scrutinize the input of all types of materials into crematories while looking for and encouraging alternative materials to be used whenever possible. Important environmental questions will continue to arise and it is important to address them by relying on the factual information that is available to us. Being a good environmental neighbor requires us to be fact based, informed and involved.



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