



The CANA Perspective on Particulate Emissions and Mercury: An In-Depth Look at a Global Controversy

For years, The Cremation Association of North America (CANA) has witnessed the concern surrounding cremating human remains and the corresponding release of primarily two emissions: particulate matter (PM) and mercury (Hg). PM can be defined as solid particles suspended in a gas as a byproduct of all combustion processes, including cremations. Mercury on the other hand, is derived from the use of silver amalgam in dental fillings that is released into the environment during the cremation process. A task force was developed by CANA to further investigate the issues; the results of the investigation are included in this report.

Particulate emissions (PM) are released into the environment in many ways, including through residential and commercial fuel-based heating — through cars, trucks, restaurant grills and fireplaces. None of these common community sources of PM have any emission controls to reduce, monitor or limit PM emissions. Crematories, however, have emission controls as part of their design to limit the amount of PM entering the atmosphere.

According to the U. S. Environmental Protection Agency (USEPA), there are many ways mercury emissions are released into the air. Some of these common sources include municipal incinerators, the breaking of used fluorescent tube lamps, dental facilities, production and disposal of batteries, household trash disposal and residential heating. USEPA lists the operation of crematories as one of the lowest sources of Hg emissions. Mercury emissions from cremation are very low and they are not regulated by any environmental agency. Under the Clean Air Act, the USEPA reviewed and updated national air-quality standards for all types of possible pollutant sources, including crematories. This review considered all possible pollutants including PM and mercury. As a result, crematories were not considered for any further federal regulation. CANA surveyed various crematories throughout the United States — Virginia, Georgia, Illinois, Washington, Florida, Indiana, Kentucky, California, Wisconsin and New York were just a few states to respond. CANA asked if there has ever been an air-quality or environmental agency in these areas that raised a concern regarding the release of mercury emissions from their crematories: The unanimous answer was no.

The American Dental Association (ADA), which oversees and regulates dentists in the United States, reports that since 1990 the use of silver amalgam has dropped from a 68-percent usage rate to 30 percent. The ADA attributes this decrease to the patients' preferences for natural-looking non metallic dental fillings. Moreover, continuous changes in dental practices, as the durability of other cavity-filling materials are proven, continues to lessen the already minimal amounts of Hg being released.

Furthermore, the Indianapolis Office of Environmental Services has responded to this growing concern by performing crematory emissions studies to determine if a source would be required to obtain an air permit. The group concluded that, although Hg from silver amalgam is certainly released, in reality, emissions are quite small, below the minimum levels of all criteria pollutants and Hazardous Air Pollutants.

The USEPA also states that crematories statistically represent 0 percent of the total inventory for national mercury emission rates, according to their Best Point Estimates. Based on actual data collected in 1999, when presumably more people still had silver amalgam fillings, all the U.S. crematories combined produced a total of only 238 pounds or 108 kilograms of Hg.

Actual tests performed for USEPA at the Woodlawn Crematorium by representatives of the Midwest Research Institute in New York, and published by the USEPA, have determined the amounts of Hg

released to the environment. The tests show that in a total of nine cremations, two were suspected of not containing any silver amalgam whatsoever. They contend that the stack testing at the Woodlawn facility was considered to be representative of all crematoria operations and, therefore, a reliable source for developing an uncontrolled emission factor for use in estimating potential emissions from all crematoria. The conclusion is that the average mercury release of nine cremations yielded 0.456 grams or 0.0010 pounds of Hg per body. In addition, the average Hg release for the seven cremations believed to contain silver amalgam fillings yielded only 0.584 grams or 0.0013 pounds per body.

Further testing by Pelican Scientific in the United Kingdom measured Hg in crematoria emissions and submitted the results to The Department of Environment, Food and Rural Affairs and the Scottish Environmental Protection Agency. Both agencies accepted the tests as having been conducted in compliance with testing standards. The first test, conducted during October 2006 at the Craigton Crematorium in Glasgow, Scotland, involved 23 cremations under normal operating conditions:

- 10 remains were suspected of not having silver amalgam fillings whatsoever.
- The average Hg release per cremation of more than 23 cremations yielded 0.128 grams or 0.0003 pounds per body.
- The average Hg release per cremation for the 13 cremations believed to contain silver amalgam fillings yielded 0.227 grams or 0.0005 pounds per body.

The second test, conducted September 2007 at the Linn Crematorium in Glasgow involved 31 cremations under normal operating conditions:

- 21 remains were suspected of not having silver amalgam fillings whatsoever.
- The average Hg release per cremation of more than 31 cremations yielded 0.323 grams or 0.0007 pounds per body.
- The average Hg release per cremation for the 10 cremations believed to contain silver amalgam fillings yielded 1.001 grams or 0.0022 pounds per body.

This information confirms that the Hg emissions information located in the USEPA National Emissions database is accurate for determining the Hg impact of cremations; and based on significant and unbiased testing, Hg emissions from crematories are not deemed sufficient to be regulated.

All the data available has already prompted notable environmentalists to draw realistic conclusions in regard to the emissions of Hg. Environmental Scientist Alexis Cain, of the Chicago office of the Environmental Protection Agency said, "I don't think it's a risk to people who live in the vicinity of crematoriums."

Two specific practices target the reduction of Hg emissions into the atmosphere via cremations. CANA recommended that neither of these directives be mandated:

- The first measure would be the installation of filtration systems or "bag houses" to the cremation equipment. There is no guarantee that these filtration systems will prevent the release of Hg into the environment, not to mention that they are extremely cost-prohibitive.
- The second measure suggests that teeth containing silver amalgam should be pulled prior to the cremation process. CANA considers this an act of mutilation and such an act would violate the respectful manner in which cremationists perform their duties. The notion that teeth-pulling would even be suggested implies that some individuals are not approaching this matter with objective insight. The misguided fear of mercury emissions clouds the realistic assessment of their environmental impact. Our decisions should be based on the soundness of the data collected and intellectually interpreted.

The most extensive cremation equipment emissions research ever undertaken confirms that the design and operation of typical North American crematories provides significantly better emissions than regulations required, and even exceeds expectations with the older operating systems.

Summing up the matter, Samantha Wetzler, M.D., a medical examiner in the Tidewater Virginia region, said, "There are so many variables, and so many sources of mercury both to people and the environment, of which none have been eliminated ... not fish, amalgams, coal plants, industrial emissions and the breaking of light bulbs. It seems that regardless of what studies one does, no one will be able to predict these things, and pointing a finger at a crematory as one source that must be stopped seems ridiculous and frivolous. A neighbor putting a fluorescent bulb into the trash rather than recycling it properly will create more concrete hazards for the community than any amounts crematories will ... but policing of peoples' trash is not in the plans."

###

CANA is the recognized authority for all information, education, products, services and support for cremation. Founded in 1913, CANA is an International organization of over 1,300 members, composed of cemeterians, cremationists, funeral directors, industry suppliers and consultants. CANA's purpose is to actively lead and support the providers of cremation services and to promote memorialization. This is accomplished through the highest standards of ethics, education and consumer information. CANA's members support and adhere to the following principles: integrity and ethics; excellence; professional development and education; and leadership and innovation. For more information about CANA, visit www.cremationassociation.org.