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Testing Results:

Visible Emissions:
The visible emissions were evaluated every 15 seconds and rated on a scale from 0% to 100% opacity by a qualified inspector.

The opacity readings for each cremation were then averaged over the six-minute period with the highest emissions. Figure 1 shows that visible emissions increased as the operating temperature increased. Comparison is given to a typical state emission limit.

Particulate Matter:
The results of sampling show that particulate matter emissions also increased with temperature. Overall, the emissions of particulate matter were very low.

The average test results for particulate matter (shown in Figure 2) as well as the results for all of the following pollutants, are for the inlet to the scrubber. A comparison of the emissions before and after the water scrubber showed that the device had little to no effect on the emissions of any of the pollutants.

Carbon Monoxide:
The levels of carbon monoxide (Figure 3) were very low for each test condition, well below the typical state standard of 100 parts per million.

Nitrogen Oxides and Sulfur Dioxide:
The levels of these gases (shown in Figures 4 and 5) were within acceptable limits.

Hydrogen Chloride:
Hydrogen chloride (HCl) is a gaseous pollutant produced by the burning of plastics or other material containing chlorine. The HCl emissions would not be expected to change with temperature. The average HCl emission for all the conditions was 0.15 pound per hour of operation.

Metals:
Like HCl, emissions of mercury, cadmium, and lead are not expected to vary with operating temperature. The metal of concern from crematories is mercury, which mainly comes from dental fillings. The average mercury emission was 0.23 gram per hour of operation.

Dioxins and Furans:
Dioxins and furans are complex compounds released from many different combustion sources. The presence of chlorine in the combustion process is an important factor for dioxin and furan formation.

The test results show that the emissions of dioxins and furans went up as the temperature increased. The emissions, (shown in Figure 6) are low compared to other types of incinerators. The measurement unit is the nanogram, which is one -billionth of a gram.

Conclusion:

The test results show that the emissions of nearly all the tested pollutants increased when the operating temperature was raised. This indicates that there is no justification or benefit for the high operating temperatures required in many states.

The results also demonstrate that crematories are capable of low emissions without the use of additional pollution control equipment.

These findings should provide a positive benefit to the cremation industry as the EPA creates the new regulations.

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40 CFR Part 60/Vol 70 No 241
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9. Various Other Applicability Issues
Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Other Solid Waste Incineration Units; Final Rule
excerpt . . .

Human Crematories. Two commenters objected to the exemption of human crematories from the proposed rules. Both commenters argued that the incineration of human bodies emits significant quantities of mercury and other hazardous air pollutants. One commenter objected to EPA's conclusion that human bodies are not solid waste and noted that EPA defines solid waste under the SWDA as any "discarded material." The definition also clarifies that a material is "`discarded" if it is `burned or incinerated."

Clean Air Act section 129 regulations deal solely with solid waste combustion units. As noted in the preamble to the proposed rules, in considering the nature of human crematories, EPA has determined that the human body should not be labeled or considered "solid waste." Therefore, human crematories are not solid waste combustion units, and are not a subcategory of OSWI for regulation.

We disagree with the commenter's assertions that human bodies are discarded and that CAA section 129 rules must consider a material to be "discarded" if it is "burned or incinerated." The definition of "discarded" referred to by the commenter is found in 40 CFR part 261, which defines "hazardous waste" for the purpose of implementing the hazardous waste program authorized by the SWDA. In defining "hazardous waste," 40 CFR part 261 also defines "solid waste" and elaborates on the meaning of "discarded," which is a term used in the definition of solid waste. However, in doing so, 40 CFR part 261 states explicitly in 40 CFR 261.1(b)(1) that this definition of solid waste is only for the purpose of materials that are hazardous wastes. Much of the complexity and specificity of the 40 CFR part 261 definitions is needed to assure that hazardous waste is properly identified, tracked, transported, and disposed of, and is not inappropriately discarded or abandoned. The 40 CFR part 261 details on the meaning of solid waste and discarded are not found in solid waste definitions within the Resource Conservation and Recovery Act (RCRA) rules pertaining to nonhazardous wastes (e.g., 40 CFR part 240 through 40 CFR 259). The regulatory definitions of "solid waste" and "discarded" found in 40 CFR part 261, therefore, do not apply to nonhazardous solid wastes. Section 129 of the CAA regulates only nonhazardous solid wastes. As described in previous **Federal Register** notices pertaining to the proposed and final CISWI rules (64 FR 67104, November 30, 1999 and 65 FR 75342, December 1, 2000) EPA has adopted, under the joint authority of the CAA and RCRA, a definition of solid waste that is used solely to identify nonhazardous solid waste for the regulatory programs authorized by CAA section 129, such as the final CISWI and OSWI rules. The definition of discarded cited by the commenter is not applicable to CAA section 129 rules. However, as stated in the preamble to the proposed OSWI rules, if EPA or States determine in the future that human crematories should be considered for regulation, they would be addressed under other authorities.

Animal Crematories. One commenter expressed support for the proposed decision to exclude animal crematories as a regulated subcategory of the proposed OSWI rules and supports the proposed exclusion of pathological waste incineration units. The commenter pointed out that the other alternatives to incineration, such as rendering, burial, composting or feeding of the carcass to exotic animals does not address the need for disposal of animal carcasses with an infectious disease. Another commenter contended that animal crematories are solid waste incineration units that must be regulated under CAA section 129.

EPA has not changed our decision to exclude animal crematories and pathological waste incineration units, based on our analysis of their emissions and the adverse impacts that would occur if these units were regulated under the final OSWI rules, as fully described in the preamble to the proposed rules and in the response to comments document.

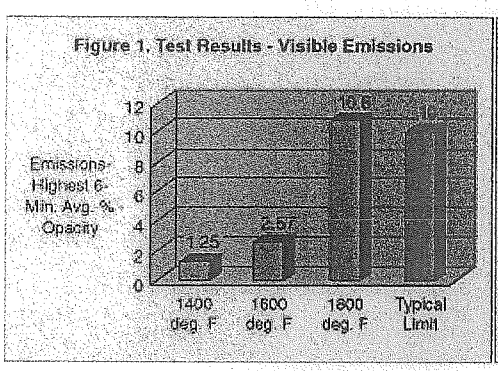
MERCURY UPDATE

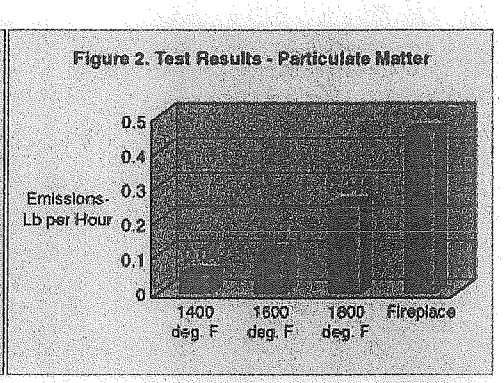
Crematories represent *0%* of the total inventory for national mercury emissions rates according to US EPA and their Best Point Estimates.

Most recently, US EPA updated their National Emissions Inventory and, based on actual data from testing they participated in, all US crematories combined in 1999 produced a total of 238 pounds of mercury.

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

Silver amalgam tooth 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 has already declined by 30%, a significant decrease. Although concern for the environment has always been a priority for the dental industry, the primary driver of this trend is actually found in the mirror, appearance. Composite resins blend better with the color and appearance of natural teeth. All these changes in dental practices and consumer preferences have resulted in significantly less mercury entering the cremation stream and thereby reducing mercury emissions by reducing mercury input.





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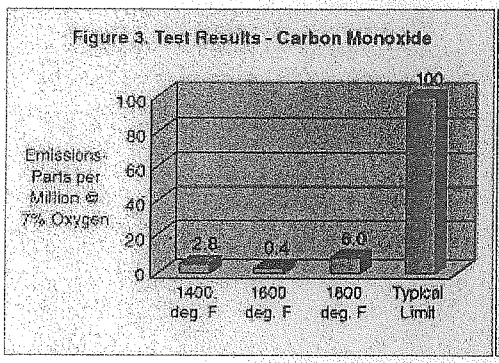

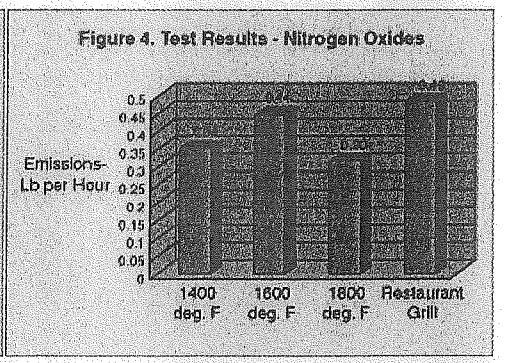

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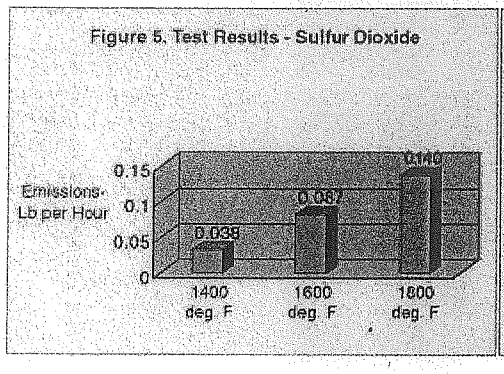

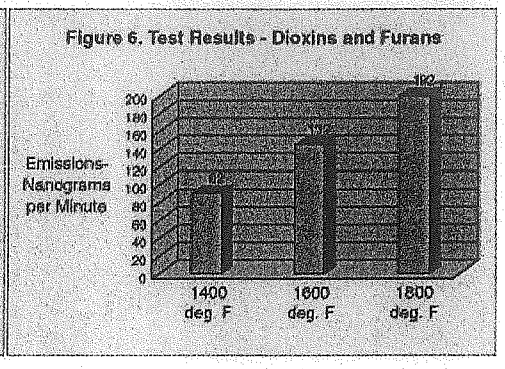

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