

Pollution Prevention Opportunities Checklist for Human Crematoriums

The following are the pollutants typically associated with crematory operations.

- visible emissions
 - particulate matter
 - carbon monoxide
 - nitrogen oxides
 - sulfur dioxide
 - hydrogen chloride
 - metals (cadmium, mercury, and lead)
 - dioxins and furans
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Pollution Prevention Opportunities

How well a cremator reduces pollutant output depends largely on the design, upkeep and operation of the equipment.

Cremation Unit Design

- Are best available control technologies incorporated into unit's design to limit pollutant emissions as low as possible? ___Yes ___No ___NA
- Does the design ensure that resultant stack emissions during normal cremation unit operation satisfy all limits? ___Yes ___No ___NA
- Does your crematory unit's charging system have an interlocking mechanism to prevent coffin entry into the primary combustion chamber until the temperature within the secondary combustion chamber is above 1600°F? ___Yes ___No ___NA
- When replacing older crematory units, have you considered a high-efficiency unit whose design can eliminate as much as 99.9% of all harmful emissions, smoke, and odors? ___Yes ___No ___NA

General Operation

- Do you maintain a high standard of housekeeping and maintenance to keep your equipment in good operating condition to help reduce emissions? ___Yes ___No ___NA
- Do you have a preventive maintenance program for all air pollution control equipment? ___Yes ___No ___NA
- Do you keep important spare parts and regular use items on-site to quickly resolve equipment failure problems? ___Yes ___No ___NA
- Promptly correct any malfunction or breakdown that could impact emissions until normal operation can be restored? ___Yes ___No ___NA
- Monitor your air emissions on a regular basis to verify that your emissions are within acceptable limits as defined in Rule 62-296.401(5) of Florida Administrative Code (F.A.C.)? ___Yes ___No ___NA
- Do you check all air pollution control and continuous emission monitoring equipment daily for proper operation and function before proceeding with the cremation process? ___Yes ___No ___NA

- Do you record and keep on-site all performance evaluations, calibration checks, adjustments, preventative maintenance and corrective maintenance performed on all monitoring systems and devices in a permanent form for inspection purposes? ___Yes ___No ___NA
- Does temperature chart monitoring documentation include operator name, cremation start times in the primary chamber, date, time, and temperature markings? ___Yes ___No ___NA
- Do you wait until the secondary chamber combustion zone temperature reaches 1800°F to begin each cremation? ___Yes ___No ___NA
- Do you cremate the heaviest bodies first to minimize high temperature excursions, which can damage the crematory and reduce the chance of exceeding the capacity of the equipment with regard to cremation time, which can lead to exceeding of 5% visible emissions from the exhaust stack? ___Yes ___No ___NA
- Do you provide sufficient amounts of oxygen, temperature and turbulence to completely burn your auxiliary fuels (natural gas, LP gas or oil) and the products of combustion given off during cremation to avoid significant emissions of carbon monoxide? ___Yes ___No ___NA
- Do you request from your clients that no unnecessary items be included in the cremation container to minimize the chance of exceeding the capacity of the equipment with regard to cremation time, possible explosions, harmful fumes and excess visible emissions from the exhaust stack? ___Yes ___No ___NA
- Do you cremate only dead human bodies in appropriate containers that contain no more than 0.5 percent by weight chlorinated plastics as documented by the container manufacturer's Material Safety Data Sheet? ___Yes ___No ___NA
- If you incinerate containers, do you have appropriate documentation (e.g. Material Safety Data Sheets) from container manufacturers certifying that they are composed of 0.5 percent or less by weight chlorinated plastics? ___Yes ___No ___NA
- Do you keep this documentation for the duration of their use and up to two years after their use? ___Yes ___No ___NA
- Do you request containers free of chlorinated plastics to reduce the amount of hydrogen chloride produced from the cremation? ___Yes ___No ___NA

Material Handling, Storage and Disposal

- Do you carefully remove ash and non-combustible residues to minimize fugitive dust emissions? ___Yes ___No ___NA
- Do you remove remains from cremator(s) only when each incineration is complete to minimize fugitive dust emissions? ___Yes ___No ___NA
- Do you move and store cremated remains in a covered container? ___Yes ___No ___NA
- Do you provide local extraction hoods connected to a bag filter above workstations where treatment of cremated remains occurs? ___Yes ___No ___NA
- Are you aware that mis-handling of these materials could be of hazard to you and other persons who come in contact with remains? ___Yes ___No ___N

Staff Training

- Do you have a cremation unit operator training program? ___Yes ___No ___NA
- Does your training program provide a minimum of 8 hours of instruction? ___Yes ___No ___NA
- Are operators trained by the equipment manufacturer representatives or an equivalent organization using a state-approved training program? ___Yes ___No ___NA

- Does your training program meet the minimum cremation criteria defined in the EPA Medical Waste Incinerator Operator Training Program Course Handbook, EPA 453/B-93-018, and Instructor's Guide, EPA 453/B-93-019? ___Yes ___No ___NA
- Does training provide a basic understanding of the principles of the combustion process, instruction on proper operating practices and procedures, and increase awareness of regulation requirements and safety concerns? ___Yes ___No ___NA
- Does your operator training program provide, at a minimum, hands-on experience involving start-up, operation of at least one cremation, shut-down of the equipment, and one full cycle of preventive maintenance actions? ___Yes ___No ___NA
- Do you keep records of operator training (e.g. copy of training certificates)? ___Yes ___No ___NA
- Are operator training certificates easily located for inspection purposes? ___Yes ___No ___NA
- Do you allow only operators who have completed the training program to operate your cremator? ___Yes ___No ___NA

Monitoring, Sampling and Measurement of Emissions

- Do you test your cremation unit annually for compliance with emissions standards for all pollutants of concern? ___Yes ___No ___NA
- Do you continuously monitor and record secondary combustion chamber outlet oxygen levels and gas temperature levels? ___Yes ___No ___NA
- Do these monitors provide immediate display readings to the operator? ___Yes ___No ___NA
- Are these monitors equipped with audible and visual alarms to alert the operator of malfunctions and out-of-limit readings? ___Yes ___No ___NA
- Do you check all monitoring instruments for correct functioning, and calibrate prior to use? ___Yes ___No ___NA
- Do you continuously monitor and record in-stack levels of particulate matters and carbon monoxide? ___Yes ___No ___NA
- Do you monitor your particulate matter emissions to ensure that they do not exceed 0.080 grains per dry standard cubic foot of flue gas, corrected to 7% O₂? ___Yes ___No ___NA
- Do you monitor your carbon monoxide (CO) emissions to ensure they do not exceed 100 parts per million by volume, dry basis, corrected to 7% O₂ on an hourly average basis? ___Yes ___No ___NA
- Do you maintain a daily logbook to monitor your compliance with usage limitations (e.g. date, number of cremations, length of cremation cycle, operating hours, containers, body weights, etc.) ___Yes ___No ___NA
- Do you follow the emissions test methods and procedures as defined for human crematories under Chapter 62-297, F.A.C. for visible emissions, carbon monoxide, oxygen, particulate emissions, and minimum sample volumes? ___Yes ___No ___NA
- Do you follow the Testing Frequency requirements as defined under Rule 62-210.300(4), F.A.C.? ___Yes ___No ___NA

Temperature/Retention Time

- Does cremation unit design provide a sufficient volume in the secondary chamber combustion zone to provide at least a 1.0 second gas residence time at 1800 ° F (primary chamber and stack times should not be used in calculating the residence time)? ___Yes ___No ___NA

- Does actual operating temperature of the secondary chamber combustion zone provide no less than 1600 ° F throughout the combustion process in the primary chamber? ___Yes ___No ___NA
- Do you check that the secondary chamber combustion zone temperature is equal to or greater than 1600° before cremation in the primary chamber begins? ___Yes ___No ___NA
- Do you increase how long the gases produced from cremation are held in the cremation equipment and exposed to proper temperatures (1600°F - 1800° F) before they exhaust to the atmosphere to minimize pollutant emissions? ___Yes ___No ___NA
- Do you maintain adequate and steady temperature levels in the desired 1600°F to 1800°F operating range (Temperatures outside of your cremation unit's design range can increase exhaust pollutants)? ___Yes ___No ___NA

Control Equipment

- Do you use automatic control devices that measure and compare process variables (temperature, opacity, CO, O2), to the required set-points as defined in F.A.C. 62-296.401.
- Do the automatic control devices automatically take action to maintain the set-points? ___Yes ___No ___NA
- Does your control equipment have the ability to record on paper the corrective actions taken to maintain process variables, and send this information to a computer and printer? ___Yes ___No ___NA
- Does your cremation equipment include a bag house to collect particulate matter? ___Yes ___No ___NA
- Does your cremation unit use ambient dust collectors to minimize operator exposure to dust? ___Yes ___No ___NA
- If you have a mechanically-fed cremation unit, is an an air-lock system used to prevent opening the incinerator to the room environment? ___Yes ___No ___NA

Important Notes:

Did you know that failure to perform regular maintenance of your crematory equipment, records and operator training could result in non-compliance issues and enforcement of state, federal and local rules, with financial penalties?

Did you know that when non-compliance issues arise contact must be made to the regulating authority immediately with a description of the occurrence and corrective actions to the operation of the crematory should be made to re-achieve compliance?

**Contact Pinellas County's
Pollution Prevention and Resource Recovery (P2R2) Program at 464-4761
for Waste Reduction Assistance**