



BUREAU OF AIR QUALITY

STANDARD PROTOCOL (SP-014) Human or Animal Crematory Incinerators

SECTION A. GENERAL REQUIREMENTS

1. Regulatory Authority and General Description

As an alternative to a site-specific testing protocol, human or animal crematory incinerators that operate under BAQ-GPA/GP-14 may opt to utilize this Standard Protocol (SP), whose conditions are described herein. All performance testing shall be conducted in accordance with the provisions of [BAQ-GPA/GP-14](#) and applicable regulatory requirements. This SP may not be utilized by a crematory incinerator subject to a state only operating permit.

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3. Definitions

Words and terms not otherwise defined in this SP shall have the meaning defined in BAQ-GPA/GP-14 unless the context indicates otherwise.

Charge – Place or load a container with remains inside the crematory incinerator.

Cremation Cycle – The thermal process of a crematory incinerator that starts when the primary chamber burner is ignited and ends when the remains have been reduced to bone fragments.

Crematory Incinerator – A furnace or apparatus for burning animal or human remains to bone fragments. This term does not include equipment used for flameless cremation, including alkaline hydrolysis and natural organic reduction.

Maximum Routine Operating Conditions (MROC) – representative operating conditions (e.g. cremation rate in lb/hr) which are routinely achieved, that potentially result in the maximum air emissions. [The Clean Air Act National Stack Testing Guidance](#) contains more clarification on “REPRESENTATIVE TESTING CONDITIONS.” Refer to Section 8 of this document for the required operating conditions during testing.

Rated Capacity – Highest cremation rate, measured in lb/hr, a crematory incinerator can achieve as determined by the manufacturer. Refer to Section 8 of this document for the required operating conditions during testing.

Source – An air contamination source.

4. Applicability/Scope

SP-014 is applicable to human or animal crematory incinerators that meet all of the following criteria:

- (a) have rated capacities less than 500 pounds per hour;
- (b) are subject to BAQ-GPA/GP-14; and
- (c) are required by BAQ-GPA/GP-14 Condition 13(b) to conduct source testing.

This SP may not be utilized by a crematory incinerator subject to any other permit, such as a state only operating permit. Nothing in this SP, the Department's Source Testing Manual, or the Source Testing FAQs creates any obligation to conduct source testing that is not otherwise required by BAQ-GPA/GP-14.

5. Authorization to Use SP-014

- (a) *Authorization to Use SP-014.* Any facility subject to BAQ-GPA/GP-14 that agrees to meet the terms and conditions of this SP is authorized to use it.
- (b) *Terms of Authorization to Use SP-014.* This SP authorizes performance testing at the specific facility detailed in the Test Notification (refer to Section 7) for the specified performance test program.
- (c) *Delay in Testing.* If testing is not conducted on the scheduled date in the Test Notification, DEP must be notified as soon as possible. Refer to Section 7 for more details.
- (d) *Transfer of Ownership.* The authorization to use this SP may be transferred from the original owner or operator of a facility to the new owner or operator of that facility. A new owner or operator remains subject to the terms and conditions of SP-014 herein.
- (e) *Modification, Suspension, or Revocation of SP-014 or Authorizations to Use SP-014.*
 - (i) DEP may modify, suspend, or revoke and reissue this SP.
 - (ii) An authorization to use SP-014 may be suspended or revoked if DEP determines that the human or animal crematory incinerator cannot be accurately tested under this SP.
 - (iii) An authorization to use SP-014 may be suspended or revoked if DEP determines that, at any time, the owner, operator, and/or their subcontractor(s) has failed to test the source(s) in accordance with the terms and conditions of this SP.
 - (iv) Upon suspension or revocation of an authorization to use SP-014, the owner or operator shall immediately cease use of this SP and submit a site-specific testing protocol to DEP.
 - (v) Failure to strictly adhere to this SP will result in a rejection of the test results and may lead to a requirement to retest.

6. Applicable Regulations

- (a) Applicable Federal regulations:
 - (i) There are currently no Federal Regulations that apply to crematory incinerators. Should the U.S. Environmental Protection Agency (EPA) promulgate regulations applicable to crematory incinerators, DEP will implement measures at least as stringent as those requirements consistent with Section 4 of the Air Pollution Control Act (35 P.S. § 4004).
 - (ii) All stack testing shall be conducted in accordance with referenced EPA promulgated test methods and EPA's [*Clean Air Act National Stack Testing Guidance*](#).
- (b) Applicable state regulations:
 - (i) 25 Pa. Code Chapter 139.1- Sampling facilities. Refers to sampling and testing facilities in Pennsylvania and outlines requirements and procedures for sampling and testing methods.
 - (ii) 25. Pa. Code Chapter 139.2- Sampling by others. Outlines the rules for sampling and testing performed by persons other than DEP. DEP must be provided with reasonable notice and opportunity to observe sampling and testing.

- (iii) 25 Pa. Code Chapter 139.3- General requirements. Outlines the methods used by DEP to assess emissions from stationary sources.
 - (iv) 25 Pa. Code Chapter 139.11(1)- Performance tests shall be conducted while the source is operating at maximum routine operating conditions or under such other conditions, within the capacity of the equipment, as may be requested by the Department.
 - (v) 25 Pa. Code Chapter 139.11(2)- DEP will consider test results for approval where sufficient information is provided to verify the source conditions existing at the time of the test and where adequate data is available to show the manner in which the testing was conducted.
- (c) General Permit BAQ-GPA/GP-14:
- (i) Existing crematory incinerators for which construction commenced on or before April 17, 1989, are subject to BAQ-GPA/GP-14, Section B. Refer to Table 1 in this SP.
 - (ii) Crematory incinerators for which construction commenced after April 17, 1989, are subject to BAQ-GPA/GP-14, Section C. Refer to Table 2 in this SP.

7. Test Notifications

Any person proposing to use this SP shall submit a test notification (as explained in the [Source Testing FAQs](#) Questions 1 and 26) to the applicable DEP Regional Office and DEP's Source Testing Section at least 30-days in advance of the target test date, unless otherwise approved by DEP.

Acceptance of all testing is contingent upon the conformance to the information in the current version of the [Source Testing FAQs](#). Failure to obtain DEP approval may result in rejection of test results and possible enforcement action. Final acceptance of the test results is also contingent upon fulfillment of all the applicable requirements specified in the most current version of DEP's [Source Testing Manual](#) and this SP.

Postponement or stoppage of a scheduled performance test must be communicated as soon as possible to the applicable DEP Regional Office and DEP's Source Testing Section. A thorough and complete justification of the postponement or stoppage must be provided to the applicable DEP Regional Office and DEP's Source Testing Section. This would include all preliminary or pretesting, if conducted, that was used in making the decision to postpone or stop. Stoppages/Postponements and their ramifications are addressed in Sections 6 and 7 of EPA's [Clean Air Act National Stack Testing Guidance](#).

8. Recordkeeping Requirements

The process parameters listed in Table 3. Process Data Summary (see Section 9. Reporting Requirements) must be monitored and recorded every 15 minutes during performance testing. If a parameter is not applicable, "N/A" must be entered into Table 3.

Quality assurance conducted for the performance testing program must include the following, at a minimum:

- (a) maximum routine operating condition (MROC, in terms of cremation rate measured in lb/hr and/or rated capacity measured in lb/hr).
- (b) date and name of the servicing company and technician that performed the most recent burner tuning.
- (c) EPA Method 3A analyzer response time, calibrations, calibration error, drift checks, and bias check (as applicable) and EPA Method 5 probe length and rinse volumes.
- (d) calibration gas certificates (if applicable).
- (e) sampling system (15-minute interval) temperature checks.

9. Reporting Requirements

- (a) The test report must conform to (1) the requirements in the Source Test Reports section of the current version of DEP's [Source Testing Manual](#) and (2) this SP.

- (b) For test report submittals, refer to the current information in the [Source Testing FAQs](#).
- (c) The test report must contain all data collected relating to the performance testing program, such as pre-compliance, preliminary, and informational testing in preparation of the performance test.
- (d) The submitted report should be formatted as specified in EPA Emission Measurement Center Guideline Document (GD-043) [Preparation and Review of Emission Test Reports](#) (December 1998).
- (e) Reported test results must follow the significant figures guidance found in EPA Emission Measurement Center Technical Information Document (TID-024) [Memo on Rounding and Significant Figures](#) (June 6, 1990).
- (f) The following tables (see Section 6(c) for applicability) must appear in the test report:

Table 1. Source Name (Source ID Number) Test Results Summary (TRS)
Constructed on or before April 17, 1989

Constructed on or before April 17, 1989						
Run No.	1	2	3	Average	Standard	Compliance Status Pass/Fail
Test Date						
Flow [dscfm]						
Cremation Rate [lbs./hour]						
MROC [lbs./hour]						
Cremation Rate [%MROC]						
Filterable PM [gr./dscf @ 12% CO ₂] [lbs./hour]					<0.10	

Table 2. Source Name (Source ID Number) Test Results Summary (TRS)
Constructed after April 17, 1989

Constructed after April 17, 1999						
Run No.	1	2	3	Average	Standard	Compliance Status Pass/Fail
Test Date						
Flow [dscfm]						
Cremation Rate [lbs./hour]						
MROC [lbs./hour]						
Cremation Rate [%MROC]						
Filterable PM [gr./dscf @ 7% O ₂] [lbs./hour]					<0.080	

Table 3. Source Name (Source ID Number) Process Data Summary ¹

Run No.	1	2	3	Averages
Test Date				
Start Time of Run				
End Time of Run				
Total Time of Run [min.]				
Start Time of Cremation Cycle				
End Time of Cremation Cycle				
Total Time of Cremation [min.]				
Fuel Type				
Fuel Usage [gpm or cfm]				
Charge Weight [lbs.]				
Cremation Rate [lbs./hour]				
Primary Chamber Temperature [°F]				
Secondary Chamber Temperature [°F] ²				

¹ If a parameter is not applicable, "N/A" must be entered into Table 3.

² Note in the final report if the afterburner has more than 1 thermocouple to measure operating temperatures by including the thermocouple number/other information (as applicable) and the location(s) in the simple source diagram. Also include residence time(s) and how they were determined, including for example, from the manufacturer's information or measured during a test run.

Table 4. Source Name (Source ID Number) Methods 3A Calibration Summary ¹

Pollutants	Cv	Cdir	ACE	Allowable ACE	Pass (Yes/No)
Oxygen					
Low (or Zero)					
Mid					
High					
Span Value					
Carbon Dioxide					
Low (or Zero)					
Mid					
High					
Span Value					

¹ All quality assurance documentation and calculations for the performance test must be included in the test report to provide evidence that the process and testing data is accurate and representative of actual testing conditions.

Table 5. Source Name (Source ID Number) QA Summary ¹

Run No.	1	2	3	Standard	Pass (Yes/No)
Test Date					
Oxygen					
Span (%)					
Low Bias (% of span)				±5	
Upscale Bias (% of span)				±5	
Low Drift (% of span)				±3	
Upscale Drift (% of span)				±3	
Carbon Dioxide					
Span (%)					
Low Bias (% of span)				±5	
Upscale Bias (% of span)				±5	
Low Drift (% of span)				±3	
Upscale Drift (% of span)				±3	

¹ All quality assurance documentation and calculations for the performance test must be included in the test report to provide evidence that the process and testing data is accurate and representative of actual testing conditions.

10. Source Testing Requirements

- (a) Federal Requirements – All performance testing shall be in accordance with EPA Methods 1, 2, 3A, 4, and 5 as applicable.
- (b) State Requirements – Specific State conditions and common reminders are as follows:
 - (i) EPA Method 1: Cyclonic flow checks must be conducted and recorded at each testing location. Checks must take place at each traverse point and be consistent with conditions during testing. All sampling ports, meeting EPA Method 1 criteria for spacing, must be accessible. Additionally, all sampling ports must remain stuffed/blocked during all testing activities.
 - (ii) EPA Method 2: Pitot tube openings must be of proper shape and be undamaged. A damaged pitot will void all volumetric flow and mass emission rate data.
 - (iii) EPA Method 3A: a stratification test per §8.1 of EPA Method 3A must be performed to determine the number of sampling points for O₂ and CO₂.
 - (iv) EPA Method 5: Acetone rinses of 200 mL or 30 mL per foot of sample probe length, whichever is greater, are required and must be documented in the test report. Nozzles and probe liners must be glass. A minimum of 50 dscf per test run must be collected.
 - (v) All gases must be prepared in accordance with EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards, when commercially available.
 - (vi) Each of the EPA Method 5 test runs must encompass an entire cremation cycle. If the cremation cycle is less than 60 minutes, testing must encompass an integral number of cremation cycles per run such that the minimum sampling time per run is 60 minutes. For long cremation cycles (greater than 8 hours), the sampling time per run is subject to pre-approval by DEP.
 - (vii) Per 25 Pa. Code 139.11(1), “[t]he source must operate at maximum routine operating conditions or under other such conditions, within the capacity of the equipment, as may be requested by [DEP].” Emission tests are to be conducted under operating conditions as outlined below in order of priority.

1. Maximum routine operating conditions (lb/hr).
2. Rated capacity (lb/hr).
3. Highest achievable cremation rate (lb/hr) on the day of testing with the understanding that if the cremation rate changes in the future another test may be required by DEP's regional staff.