



ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 51, 60, 61, and 63

[EPA-HQ-OAR-2018-0815; FRL-10012-11-OAR]

RIN 2060-AU39

Test Methods and Performance Specifications for Air Emission Sources

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This action corrects and updates regulations for source testing of emissions. These revisions include corrections to inaccurate testing provisions, updates to outdated procedures, and approved alternative procedures that will provide flexibility to testers. These revisions will improve the quality of data and will not impose any new substantive requirements on source owners or operators.

DATES: The final rule is effective on **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. The incorporation by reference of certain materials listed in the rule is approved by the Director of the Federal Register as of **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. The incorporation by reference of certain other materials listed in the rule was approved by the Director of the Federal Register as of July 6, 2006.

ADDRESSES: The EPA has established a docket for this action under Docket ID No. EPA-HQ-OAR-2018-0815. All documents in the docket are listed on the <http://www.regulations.gov> Web site. Although listed in the index, some information is not publicly available, e.g., confidential business information or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted

material, is not placed on the Internet and will be publicly available only in hard copy. Publicly available docket materials are available electronically through <http://www.regulations.gov>.

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I. General Information

A. Does this action apply to me?

The revisions promulgated in this final rule apply to industries that are subject to the current provisions of 40 Code of Federal Regulations (CFR) parts 51, 60, 61, and 63. We did not list all of the specific affected industries or their North American Industry Classification System (NAICS) codes herein since there are many affected sources in numerous NAICS categories. If you have any questions

regarding the applicability of this action to a particular entity, consult either the air permitting authority for the entity or your EPA Regional representative as listed in 40 CFR 63.13.

B. What action is the agency taking?

We are promulgating corrections and updates to regulations for source testing of emissions. More specifically, we are correcting typographical and technical errors, updating testing procedures, and adding alternative equipment and methods the Agency has deemed acceptable to use.

C. Judicial Review

Under section 307(b)(1) of the Clean Air Act (CAA), judicial review of this final rule is available by filing a petition for review in the United States Court of Appeals for the District of Columbia Circuit by **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**. Under section 307(d)(7)(B) of the CAA, only an objection to this final rule that was raised with reasonable specificity during the period for public comment can be raised during judicial review. Moreover, under section 307(b)(2) of the CAA, the requirements that are the subject of this final rule may not be challenged later in civil or criminal proceedings brought by the EPA to enforce these requirements.

II. Background

The EPA catalogs errors, corrections, and approved alternatives to test methods, performance specifications, and associated regulations in 40 CFR parts 51, 60, 61, and 63 and updates and revises these provisions periodically. The most recent revisions to testing regulations for air emission sources were proposed in the *Federal Register* on December 13, 2019 (84 FR 68069). The public comment period ended February 11, 2020, and 18 comment letters were received from the public; 13 of the comment letters were relevant, and the other 5 comment letters were considered beyond the scope of the proposed rule. This final rule was developed based on public comments that the agency received on the proposed rulemaking.

III. Incorporation by Reference

Consistent with the proposal, EPA has incorporated by reference various consensus standards. Specifically, the EPA has incorporated ASTM D 2369-10, which covers volatile organic content of coatings, in Method 24. In addition, in response to comments the EPA has incorporated ASTM D5623-16 and ASTM D7039-15a in subpart KKKK of part 60, which involves procedures for determining the sulfur content of liquid fuels. These standards were developed and adopted by ASTM International and may be obtained from <http://www.astm.org> or from the ASTM at 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

The EPA has incorporated by reference SW-846 Method 6010D and SW-846 Method 6020B in Method 12. Method 6010D covers inductively coupled plasma-atomic emission spectrometry (ICP-AES) analysis, and Method 6020B covers inductively coupled plasma-mass spectrometry (ICP-MS) analysis. These methods may be obtained from <https://www.epa.gov> or from the U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue NW, Washington, DE 20460.

The EPA has incorporated by reference Gas Processors Association (GPA) 2140 and GPA 2261 in subpart KKKK of part 60, which involve procedures for determining the sulfur content of gaseous fuels. The EPA also incorporated by reference GPA 2166 and GPA 2174 in subpart KKKK of part 60, which involve procedures for obtaining samples from gaseous and liquid fuels, respectively. These GPA standards were developed and adopted by the Gas Processors Association and may be obtained from <https://gpamidstream.org/> or from the Gas Processors Association, 6526 East 60th Street, Tulsa, OK 74145.

The EPA has incorporated by reference International Organization for Standardization (ISO) 10715 in subpart KKKK of part 60. This standard involves procedures for obtaining samples from gaseous fuels. This standard was developed by the International Organization for Standardization and may be obtained from <https://www.iso.org/home.html> or from the IHS Inc., 15 Inverness Way East, Englewood, CO 80112.

The EPA incorporated by reference American Petroleum Institute (API) Manual of Petroleum Measurement Standards, Chapter 14-Natural Gas Fluids Measurement, Section 1-Collecting and Handling of Natural Gas Samples for Custody Transfer (MPMS 14.1) in subpart KKKK of part 60. This standard involves procedures for manually obtaining sampling from gaseous fuels. This standard was developed by the American Petroleum Institute and may be obtained from <https://api.org/> or from the American Petroleum Institute, 1220 L Street NW, Washington, DC 20005.

ASTM D4057-5 (Reapproved 2000), ASTM D4177-95 (Reapproved 2000), ASTM D5287-97 (Reapproved 2002), ASTM D6348-03, ASTM D6784-02 (Reapproved 2008), and ASME PTC 19.10-1981 were previously approved for incorporation by reference, and no changes were proposed.

The EPA updated the ASTM standards referenced in Method 311, but these standards are not incorporated by reference. The EPA did not update the ASTM standards referenced in Performance Standard 18, which are not incorporated by reference.

IV. Summary of Amendments

A. Method 201A of Appendix M of Part 51

Consistent with our proposal, in Method 201A, section 1.2, the erroneous gas filtration temperature limit of 30 °C is revised to 29.4 °C. In section 1.6, the erroneous word “recommended” is corrected to “required.” Section 6.2.1(d) is revised to allow polystyrene petri dishes as an alternative to polyethylene due to the lack of commercially available polyethylene petri dishes. The polystyrene petri dishes offer similar chemical resistivity to acids and inorganics as polyethene and have been shown to transfer extreme low residual gravimetric mass to filters when used in ambient air applications. In section 8.6.6, the erroneous stack temperature of ± 10 °C is revised to ± 28 °C. In section 17.0, the erroneous caption for Figure 7 is corrected from “Minimum Number of Traverse Points for Preliminary Method 4 Traverse” to “Maximum Number of Required Traverse Points,” and the erroneous y-axis label is corrected from “Minimum Number of Traverse Points” to “Maximum Number of Traverse Points.”

B. General Provisions (Subpart A) of Part 60

Consistent with our proposal, in the General Provisions, 40 CFR 60.17(h) is revised to add ASTM D2369-10 to the list of incorporations by reference and to re-number the remaining consensus standards that are incorporated by reference in alpha-numeric order.

In 40 CFR 60.17(j) is revised to add SW-846-6010D and SW-846-6020B to the list of incorporations by reference and to re-number the remaining standards that are incorporated by reference in alpha-numeric order.

In 40 CFR 60.17(k) is revised to add GPA Standards 2166-17 and 2174-14 to the list of incorporations by reference and to re-number the remaining GPA standards that are incorporated by reference in alpha-numeric order.

In 40 CFR 60.17(l) is revised to add ISO 10715:1997 to the list of incorporations by reference.

C. Standards of Performance for New Residential Wood Heaters (Subpart AAA) of Part 60

In 40 CFR 60.534(h), the language is amended based on comments received in response to an Advance Notice of Proposed Rulemaking (ANPRM), for Standards of Performance for New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces (83 FR 61585, November 30, 2018). Several commenters stated that the final clause of these existing paragraphs would create loopholes that allow manufacturers and test labs to withhold critical testing data. The EPA recognizes that this provision was not intended to create an avenue for omissions and is clarifying these communications and their reporting.

D. Standards of Performance for Municipal Solid Waste Landfills That Commenced Construction, Reconstruction, or Modification After July 17, 2014 (Subpart XXX) of Part 60

In 40 CFR 60.766(a)(3), the text for calibration of temperature measurement is revised to provide clarity and improve the consistency of implementation, as proposed.

E. Standards of Performance for Commercial and Industrial Solid Waste Incineration Units (Subpart CCCC) of Part 60

Consistent with our proposal, Subpart CCCC of Part 60 is revised to clarify that (1) initial and annual performance testing for particulate matter (PM) for waste-burning kilns and energy recovery units (ERU) is to be conducted using Method 5 or Method 29 of Appendix A of Part 60; (2) the required particulate matter continuous parameter monitoring system (PM CPMS) is used to demonstrate continuing compliance with the PM emission limit; and (3) heat input information must be reported for each ERU. The current language in 40 CFR 60.2110(i), (i)(1)(iii) and 60.2145(b), when read together, make it clear that for purposes of demonstrating compliance with the PM emission limit, there must be initial testing and subsequently, annually and for ongoing continuous demonstration of compliance, that data from the compliant performance test in turn must be used to set an operating limit for the PM CPMS.

Paragraphs 60.2110(i)(1) and 60.2145(j) are revised to clarify that the PM CPMS coupled with an operating limit is used for continuing compliance demonstration with the PM emission limit. Paragraphs 60.2110(i)(1)(iii) and (i)(2) are revised to include Method 29 as an alternative to Method 5 to measure PM in determining compliance with the PM emission limit. Paragraph 60.2145(j) is also revised to add PM to the list of pollutants for which performance tests are conducted annually. Paragraph (p) is added to 40 CFR 60.2210 to require that annual reports include the annual heat input and average annual heat input rate of all fuels being burned in ERUs in order to verify which subcategory of ERU applies.

The required annual performance test timeframe is changed from “between 11 and 13 calendar months following the previous performance test” to “no later than 13 calendar months following the previous performance test” in paragraphs 60.2145(y)(3) and 60.2150. The current 2-month testing range can present operational and testing challenges for facilities that have multiple commercial and industrial solid waste incineration (CISWI) units. In addition, this revision is consistent with other rules, such as

the National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors, that maybe applicable to CISWI units.

Tables 6 (Emission Limitations for Energy Recovery Units) and 7 (Emission Limitations for Waste-Burning Kilns) are revised to clarify the performance test method for PM. The fourth column of the “Particulate matter (filterable)” row of Table 6 is revised to remove the requirement to use a PM CPMS as the performance test method for large ERU. The fourth column of the “Particulate matter (filterable)” row of Table 7 is revised to remove the requirement to use a PM CPMS and to instead specify Methods 5 and 29 as alternatives for measuring PM to determine compliance with the PM limit. The third column of the “Particulate matter (filterable)” row of Table 7 is changed from a 30-day rolling average to specify a 3-run average with a minimum sample volume of 2 dry standard cubic meters (dscm) per run.

F. Emission Guidelines and Compliance Times for Commercial and Industrial Solid Waste Incineration Units (Subpart DDDD) of Part 60

Consistent with our proposal, Subpart DDDD of Part 60 is revised to clarify that (1) initial and annual performance testing for PM for waste-burning kilns and ERU is to be conducted using Method 5 or Method 29 of Appendix A of Part 60; (2) the required PM CPMS is used to demonstrate continuing compliance with the PM emission limit; and (3) heat input information must be reported for ERU. The current language in 40 CFR 60.2675(i) and (i)(1)(iii) and 60.2710(b), when read together, makes it clear that for purposes of demonstrating compliance for PM, performance testing must be used initially and then annually while for purposes of ongoing continuous demonstration of compliance, data from the compliant performance test is in turn to be used to set an operating limit for the PM CPMS.

Paragraphs 60.2675(i)(1) and 60.2710(j) are revised to clarify that the PM CPMS is used for continuing compliance demonstration with the PM emission limit. Paragraph 60.2710(j) is also revised to clarify that PM performance tests are conducted annually and 40 CFR 60.2675(i)(1)(iii) and (i)(2) are

revised to include Method 29 as an alternative to Method 5 to measure PM in determining compliance with the PM emission limit.

Also, the required annual performance test timeframe is changed from “between 11 and 13 calendar months following the previous performance test” to “no later than 13 calendar months following the previous performance test” in 40 CFR 60.2710(y)(3) and 60.2715. The current 2-month testing range can present operational and testing challenges for facilities that have multiple CISWI units. Additionally, we note that this revision is consistent with other rules, such as the National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors that might be applicable to CISWI units.

Tables 7 (Emission Limitations for Energy Recovery Units) and 8 (Emission Limitations That Apply to Waste-Burning Kilns) are revised to clarify the performance test method for PM. The fourth column of the “Particulate matter filterable” row of Table 7 is revised to remove the requirement to use a PM CPMS as the performance test method for large ERU. The fourth column of the “Particulate matter filterable” row of Table 8 is revised to specify Methods 5 and 29 as alternatives for measuring PM to determine compliance with the PM emission limit. The third column of the “Particulate matter filterable” row of Table 8 is changed from a 30-day rolling average to specify a 3-run average with a minimum sample volume of 1 dscm per run.

G. Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (Subpart JJJJ) of Part 60

In Table 2 of Subpart JJJJ, text is added to clarify that when stack gas flowrate measurements are necessary, they must be made at the same time as pollutant concentration measurements unless the option in Method 1A is applicable and is being used. This revision is consistent with our proposal.

H. Standards of Performance for Stationary Combustion Turbines (Subpart KKKK) of Part 60

As explained at proposal, in 2006, the EPA promulgated the combustion turbine criteria pollutant NSPS, Subpart KKKK of 40 CFR part 60 (71 FR 38482, July 6, 2006). This rule, which includes a sulfur dioxide (SO₂) emissions standard for all fuels, such as natural gas, also made provisions to minimize the compliance burden for owners/operators of combustion turbines burning natural gas and/or low sulfur distillate oil. At the time, the Agency recognized that any SO₂ testing requirements for owners/operators of combustion turbines burning natural gas would result in compliance costs without any associated environmental benefit.

As explained at proposal, the initial and subsequent performance tests required in 40 CFR 60.4415 may be satisfied by fuel analyses performed by the facility, a contractor, the fuel vendor, or any other qualified agency as described in 40 CFR 60.4415(a)(1). However, the allowed fuel sample and sulfur content measurement methods are not typically used by fuel vendors and, as a result, tariff sheets cannot be used without approval of an alternate method. We further explained that owner/operators of the combustion turbines were now conducting sampling and testing using a limited number of test methods, which is a burden that was not intended in the original rulemaking.

To align the rule requirements with the original intent of Subpart KKKK, the EPA proposed and solicited comment on additional sampling and sulfur content measurement methods in order to provide flexibility to the regulatory community for purposes of satisfying the SO₂ performance testing requirements. Commenters supported both test methods the EPA specifically proposed and test methods the EPA solicited comments on as additional compliance options. Commenters also stated that the EPA should align the performance testing requirements in 40 CFR 60.4415 with the monitoring requirements in 40 CFR 60.4365 and allow the use of a fuel tariff sheet or contract to satisfy the performance testing requirements. Commenters further requested that the EPA should allow for the use of the fuel sampling procedures specified in section 2.3.1.4 or 2.3.2.4 of Appendix D to Part 75 to demonstrate compliance with the SO₂ performance testing requirements. The EPA did not receive any comments opposing the proposed amendments.

In this action, 40 CFR 60.4415(a) is amended, as proposed, to include GPA 2166 and ISO 10715 for manual sampling of gaseous fuels and GPA 2174 for manual sampling of liquid fuels. In addition, in response to comments supporting the EPA's solicitation for comment on additional test methods, 40 CFR 60.4415(a) is amended to include API MPMS 14.1 for manual sampling of gaseous fuels. In response to comments supporting the EPA's solicitation for comment for determining the sulfur content of liquid fuels, 40 CFR 60.4415(a) is amended to include ASTM D5623 and ASTM D7039. In response to comments supporting the EPA's solicitation for comment for determining the sulfur content of gaseous fuels, 40 CFR 60.4415(a) is amended to include GPA 2140 and GPA 2261. The EPA has determined that these additional test methods will provide additional flexibility to the regulated community without any emissions increase.

In addition, in response to comments, the EPA is amending 40 CFR 60.4415(a) to allow for the use of a purchase contract, tariff sheet, or transportation contract for the fuel as an option for demonstrating compliance with the SO₂ performance testing requirements. Also, in response to comments, 40 CFR 60.4415(a) is amended to allow for the use of the fuel sampling procedures specified in section 2.3.1.4 or 2.3.2.4 of Appendix D to Part 75 to demonstrate compliance with the SO₂ performance testing requirements. These amendments will align the performance testing requirements with the monitoring requirements in 40 CFR 60.4365 and are consistent with the original intent, including the estimated regulatory burden, of the rule. Therefore, the EPA considers these options sufficient to demonstrate compliance with subpart KKKK. The Agency notes that this approach is consistent with the SO₂ performance testing requirements in other NSPS (e.g., 40 CFR 60.49b(r) in Subpart Db).

I. Standard of Performance for New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces (Subpart QQQQ) of Part 60

In subpart QQQQ, in 40 CFR 60.5476(i), the language is amended based on comments received in response to an ANPRM for Standards of Performance for New Residential Wood Heaters, New

Residential Hydronic Heaters and Forced-Air Furnaces (83 FR 61585, November 30, 2018). Several commenters stated that the final clause of these existing paragraphs would create loopholes that would likely allow manufacturers and test labs to withhold critical testing data. The EPA recognizes that this provision was not intended to create an avenue for omissions and has now clarified these communications and their reporting.

J. Method 4 of Appendix A-3 of Part 60

In Method 4, the erroneous leak check procedures in section 8.1.3 are corrected. In response to comments, section 8.1.3.2.1 is revised to remove the erroneous probe nozzle language, and section 8.1.3.2.2 is revised to remove the erroneous reference to section 8.1.3.2.1. The erroneous section 8.1.4.2 is corrected, and in the table in section 9.1, the erroneous reference to section 8.1.1.4 is replaced with section 8.1.3.2.2.

Method 4 is revised to standardize the constants between Methods 4 and 5, and more significant digits are added to constants to remove rounding and truncation errors. Also, the option for volumetric determination of the liquid content is deleted to remove the unnecessary density conversion. We believe most method users have moved to gravimetric measurement of the liquid contents in order to reduce testing costs and increase the accuracy of liquid measurement. Revisions occur in various sections (2.1, 6.1.5, 11.1, 11.2, 12.1.1, 12.1.2, 12.1.3, 12.2.1, and 12.2.2) and Figures 4-4 and 4-5. Also, in response to comments, the language in section 8.1.2.1 is revised to be consistent with our decision to disallow the option for volumetric moisture measurement.

K. Method 5 of Appendix A-3 of Part 60

In Method 5, sections 6.2.4 and 8.1.2 are revised to allow polystyrene petri dishes as an alternative to polyethylene due to the lack of commercially available polyethylene petri dishes. The polystyrene petri dishes offer similar chemical resistivity to acids and inorganics as polyethene and have been shown to transfer extreme low residual gravimetric mass to the filters when used in ambient air applications.

Method 5 is also revised to standardize the constants between Methods 4 and 5, and more significant digits are added to constants to remove rounding and truncation errors. Also, the option for volumetric determination of the liquid content is deleted to remove the unnecessary density conversion. We believe most method users have moved to gravimetric measurement of the liquid contents to lower the cost and increase the accuracy of the liquid measurement. Revisions occur in various sections (6.1.1.8, 6.2.5, 8.1.2.1, 8.7.6.4, 12.1, 12.3, 12.4, 12.11.1, 12.11.2, 16.1.1.4, and 16.2.3.3) and in Figure 5-6. All these revisions are consistent with the proposal.

L. Method 7C of Appendix A-4 of Part 60

In Method 7C, in section 7.2.11, the erroneous chemical compound, sodium sulfite is corrected to sodium nitrite, as proposed.

M. Method 7E of Appendix A-4 of Part 60

In Method 7E, section 8.5 is revised to ensure that the specified bias and calibration error checks are performed consistently. The results of the post-run system bias and calibration error checks are used to validate the run, as well as to correct the results of each individual test run for bias found in the sampling system. The more frequently these checks are performed, the more accurate the bias adjusted data will be. All these revisions are consistent with the proposal.

N. Method 12 of Appendix A-5 of Part 60

In Method 12, sections 7.1.2, 8.7.1.6, 8.7.3.1, and 8.7.3.6 are revised to remove references regarding the use of silicone grease, which is no longer allowed when conducting Method 5, and section 12.3 is revised to correctly refer to the title of section 12.4 of Method 5.

Sections 8.7.3.3 and 12.1 are revised based on a public comment to be consistent with the revision to eliminate the option for volumetric determination of the liquid content of impingers in Method 5. The language in section 8.7.3.3 is revised, and “ ρ_w = Density of water, 0.9982 g/ml (0.002201 lb/ml)” is removed from section 12.1.

Section 16.1 allows measurements of PM emissions in conjunction with the lead measurement but does not currently provide enough detail to ensure proper PM measurement. Revisions to section 16.1 provide testers with necessary procedures to execute PM and lead emissions measurements using one sampling train.

Sections 16.3, 16.4.1, 16.4.2, 16.5, 16.5.1, and 16.5.2 are revised to specify appropriate EPA analytical methods, as well as supporting quality assurance procedures, as part of allowed alternatives for the use of inductively coupled plasma-atomic emission spectrometry (ICP-AES) and inductively coupled plasma-mass spectrometry (ICP-MS) for sample analysis. Section 16.0 currently allows three alternatives to the atomic absorption analysis otherwise required in Method 12; specifically, ICP-AES in section 16.4, ICP-MS in section 16.5, and cold vapor atomic fluorescence spectrometry (CVAFS) in section 16.6. Regarding options to use ICP-AES and ICP-MS for analysis of lead, sections 16.4 and 16.5 currently do not include either specifics for applying these candidate analytical techniques, or procedures for assessing data quality. The revisions provide the needed specificity by referencing existing EPA methods for ICP-AES and ICP-MS along with supporting quality assurance requirements. The option to use CVAFS to measure lead (section 16.6) is removed since CVAFS for lead is not generally available and there is no existing EPA method for conducting it. These revisions are consistent with the proposal.

O. Method 16B of Appendix A-6 of Part 60

In Method 16B, in section 2.1, the erroneous phrase “an integrated gas sample” is corrected to “a gas sample.” In sections 6.1 and 8.2, the reference to section 8.4.1 is changed to 8.3.1 since section 8.4.1 is renumbered to 8.3.1. The text in section 8.3, “Analysis. Inject aliquots of the sample into the GC/FPD analyzer for analysis. Determine the concentration of SO₂ directly from the calibration curves or from the equation for the least-squares line.” is moved to section 11.1 to be consistent with EPA test method formatting. Sections 8.4, 8.4.1, and 8.4.2 are renumbered to 8.3, 8.3.1, and 8.3.2, respectively, since the

text in section 8.3 is moved to section 11.1. In section 11.1, the sentence “Sample collection and analysis are concurrent for this method (see section 8.3).” is deleted. Section 11.2 is added so that a uniform set of analysis results would be obtained over the test period. These revisions are consistent with the proposal.

P. Method 16C of Appendix A-6 of Part 60

In Method 16C, in section 13.1, “gas concentration” is replaced with “span” for clarity, as proposed.

Q. Method 24 of Appendix A-7 of Part 60

In Method 24, section 6.2, ASTM D 2369-10, which is the most recent version of ASTM D 2369, is added as proposed.

R. Method 25C of Appendix A-7 of Part 60

We proposed to change the correction of non-methane organic compounds (NMOC) within the method. Currently, NMOC is to be corrected by using either nitrogen or oxygen content. The correction is through use of nitrogen unless the nitrogen content exceeds a threshold of 20 percent. When the nitrogen threshold is above 20 percent, the correction is through use of oxygen. We considered multiple options for revisions, based on data provided by industry. These options and data are available in the docket for this rulemaking, docket ID EPA-HQ-OAR-2018-0815. The revisions to the correction that we considered are for when only oxygen is used as a NMOC correction, setting a rainfall threshold in lieu of a nitrogen percent threshold, and requiring a methane measurement and using methane only as the correction. We provided amendatory text for each option in docket ID EPA-HQ-OAR-2018-0815.

Based on comments we received on proposed options, we are finalizing Option 3 with revisions to the ambient air ratio quality assurance to alleviate the sampling issues in arid areas. Therefore, sections 8.4.2, 9.1, 12.5, 12.5.1, and 12.5.2 are revised.

S. Method 26 of Appendix A-8 of Part 60

In Method 26, in section 8.1.2, the misspelled word “undereporting” in the next to the last sentence is corrected to “under reporting,” as proposed.

T. Method 26A of Appendix A-8 of Part 60

In Method 26A, section 6.1.3, a reference to section 6.1.1.7 of Method 5 is added to make the filter temperature sensor placement consistent with the requirements in Method 5. Also, in section 6.1.3, the requirement that the filter temperature sensor must be encased in glass or Teflon is added because of the reactive nature of the halogen acids. In section 8.1.5, the misspelled word “undereporting” is corrected to “under reporting.” These revisions are consistent with the proposal.

U. Performance Specification 4B of Appendix B of Part 60

In Performance Specification 4B, the response time in section 4.5 is changed from “must not exceed 2 minutes” to “must not exceed 240 seconds” to be consistent with the response time in Performance Specification 4A, as proposed.

V. Performance Specification 5 of Appendix B of Part 60

In Performance Specification 5, section 5.0, the erroneous term “users manual” is replaced with “user’s manual,” and in the note in section 8.1, the sentence “For Method 16B, you must analyze a minimum of three aliquots spaced evenly over the test period.” is added to provide consistency with the number of aliquots analyzed in Method 16B, which may be used as the reference method. This revision is consistent with the proposal. In addition, the typo, “space” in the first sentence in the note in section 8.1 is corrected to “spaced”.

W. Performance Specification 6 of Appendix B of Part 60

In Performance Specification 6, section 13.1 is revised to clarify that the calibration drift test period for the analyzers associated with the measurement of flow rate should be the same as that for the pollutant analyzer that is part of the continuous emission rate monitoring system (CERMS), as proposed. Section 13.2 is revised for clarity and to be consistent with the requirements in Performance

Specification 2, as proposed, and the erroneous reference to Performance Specification 1 is corrected to Performance Specification 2 in response to a public comment we received on the proposal.

X. Performance Specification 8 of Appendix B of Part 60

In Performance Specification 8, a new section 8.3 is added to require that an instrument drift check be performed as described in Performance Specification 2, and the existing sections 8.3, 8.4, and 8.5 are re-numbered as 8.4, 8.5, and 8.6, respectively. These revisions are consistent with the proposal.

Y. Performance Specification 9 of Appendix B of Part 60

In Performance Specification 9, the quality control and performance audit sections are clarified. In section 7.2, a requirement that performance audit gas must be an independent certified gas cylinder or cylinder mixture certified by the supplier to be accurate to two percent of the tagged value supplied with the cylinder is added.

In section 8.3, an incorrect reference concerning quality control requirements that pertain to the 7-day drift test is clarified and corrected, and an incorrect reference to the error calculation equation is corrected. In section 8.4, a requirement to ensure that performance audit samples challenge the entire sampling system including the sample transport lines is added, and quality control requirements that must be met for performance audit tests are specified by adding references to sections 13.3 and 13.4.

In section 10.1, the erroneous word “initial” is deleted from the title, “Initial Multi-Point Calibration,” and the quality control requirements that must be met for multi-point calibrations are specified by referencing sections 13.1 and 13.2 in addition to 13.3. Sections 10.1 and 10.2 are clarified such that calibrations may be performed at the instrument rather than through the entire sampling system. The inadvertently omitted word, “by” is inserted in the sentence in section 10.2 that reads, “The average instrument response shall not vary more than 10 percent from the certified concentration value of the cylinder for each analyte.”

In section 13.1, language is clarified to ensure that every time a triplicate injection is performed, the calibration error must be less than or equal to 10 percent of the calibration gas value. In section 13.2,

language is clarified to specify that the linear regression correlation coefficient must be determined to evaluate the calibration curve for instrument response every time the continuous emission monitoring system (CEMS) response is evaluated over multiple concentration levels. Section 13.4 is added to describe the quality control requirements for the initial and periodic performance audit test sample. These revisions are consistent with the proposal.

Z. Performance Specification 18 of Appendix B of Part 60

In Performance Specification 18, section 2.3 is revised to clarify that Method 321 is only applicable to Portland cement plants. Also, in section 11.9.1, the reference to Method 321 is deleted because Method 321 is specific to Portland cement plants, and it is already specified in the applicable regulations. These revisions are consistent with the proposal.

AA. Procedure 1 of Appendix F of Part 60

In Procedure 1, section 5.2.3(2), the criteria for cylinder gas audits (CGAs) as applicable to diluent monitors is specified for clarity, as proposed.

BB. Appendix B to Part 61-Test Methods

In the index to Appendix B to Part 61, the inadvertently omitted Method 114-Test Methods for Measuring Radionuclide Emissions from Stationary Sources and Method 115-Monitoring for Radon-222 Emissions are added in response to a comment on the proposed rulemaking.

CC. Method 107 of Appendix B of Part 61

In Method 107, the erroneous Equation 107-3 is corrected by adding the omitted plus (+) sign, as proposed.

DD. General Provisions (Subpart A) of Part 63

In the General Provisions of Part 63, in 40 CFR 63.2, consistent with the proposal, the definition of alternative test method is revised to exclude “that is not a test method in this chapter and” because this clarifies that use of methods other than those required by a specific subpart requires the alternative test method review and approval process.

EE. Portland Cement Manufacturing (Subpart LLL) of Part 63

In subpart LLL, the units of measurement in Equations 12, 13, 17, 18, and 19 are revised to add clarity and consistency. Equations 12 and 13 are corrected so that the operating limit units of measurement is calculated correctly. The calculation of the operating limit is established by a relationship of the total hydrocarbons (THC) CEMS signal to the organic HAPs compliance concentration. As explained at proposal, in Table 1 in Part 63, Subpart LLL, the THC and organic HAP emissions limits units are in ppmvd corrected to 7 percent oxygen. Therefore, the average organic HAP values in equation 12 need to be in ppmvd, corrected to 7 percent oxygen, instead of ppmvw. The THC CEMS monitor units of measure are ppmvw, as propane and the variables are updated to reflect this. The variables in Equations 13 and 19 reference variables in Equations 12 and 18, respectively. Those variables are updated for consistency between the equations.

The units of measurement in Equation 17 should be the monitoring system's units of measure. It is possible for those systems to be on either a wet or a dry basis. Currently, the equation is only on a wet basis, even though it should be on the basis of the monitor (wet or dry). The changes to the units of measure from ppmvw to ppmv takes either possibility into account. For Equations 17 and 18, the operating limit units of measure are changed to the units of the CEMS monitor, ppmv. These revisions are consistent with the proposal.

FF. Method 301 of Appendix A of Part 63

In Method 301, section 11.1.3, the erroneous SD in Equation 301-13 is replaced with SD_d , consistent with the proposal.

GG. Method 308 of Appendix A of Part 63

In Method 308, section 12.4, erroneous Equation 308-3 is corrected, and in section 12.5, erroneous Equation 308-5 is corrected, consistent with the proposal.

HH. Method 311 of Appendix A of Part 63

In Method 311, in sections 1.1 and 17, the ASTM is updated. Specifically, in section 1.1, ASTM D4747-87 is updated to D4747-02, and ASTM D4827-93 is updated to D4827-03. Also, in section 1.1, Provisional Standard Test Method, PS 9-94 is replaced with D5910-05. In section 17, ASTM D4457-85 is updated to ASTM D4457-02, and ASTM D4827-93 is updated to ASTM D4827-03. These updates are consistent with the proposal.

II. Method 315 of Appendix A of Part 63

In Method 315, in Figure 315-1, an omission is corrected by adding a “not to exceed” blank criteria for filters used in this test procedure. The blank criteria were derived from evaluation of blank and spiked filters used to prepare Method 315 audit samples. We set the allowable blank correction for filters based on the greater of two criteria. The first criterion requires the blank to be at least 10 times the measured filter blanks from the audit study. The second criterion requires the blank to be at least 5 times the resolution of the analytical balance required in Method 315. The “not to exceed” value is, therefore, based on the second criterion (balance resolution) because it is the higher of the two criteria. These revisions are consistent with the proposal.

JJ. Method 316 of Appendix A of Part 63

In Method 316, section 1.0, the erroneous positive exponents are corrected to negative exponents. Also, the title of section 1.0, “Introduction,” is changed to “Scope and Application” to be consistent with the Environmental Monitoring Management Council (EMMC) format for test methods. These revisions are consistent with the proposal.

KK. Method 323 of Appendix A of Part 63

In the title of Method 323, the misspelled word “Derivitization” is corrected to “Derivatization,” and in section 2.0, the misspelled word “colorietrically” is corrected to “colorimetrically.” These revisions are consistent with the proposal.

V. Public Comments on the Proposed Rule

Eighteen comment letters were received from the public on the proposed rulemaking; 13 of the comment letters were relevant, and the other five comment letters are considered beyond the scope of the proposed rulemaking. The public comments and the agency's responses are summarized in the Response to Comments document located in the docket for this rule. See the ADDRESSES section of this preamble.

VI. Statutory and Executive Order Reviews

Additional information about these statutes and Executive Orders can be found at <http://www2.epa.gov/laws-regulations/laws-and-executive-orders>.

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is not a significant regulatory action and was, therefore, not submitted to the Office of Management and Budget (OMB) for review.

B. Executive Order 13771: Reducing Regulations and Controlling Regulatory Costs

This action is considered an Executive Order 13771 deregulatory action. This final rule provides meaningful burden reduction by updating and clarifying test methods and performance specifications, thereby improving data quality and by providing source testers flexibility by incorporating approved alternative procedures.

C. Paperwork Reduction Act (PRA)

This action does not impose any information collection burden under the PRA. The revisions make corrections and updates to existing testing methodology and clarify testing requirements.

D. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. In making this determination, the impact of concern is any significant adverse economic impact on small entities. An agency may certify that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, has no

net burden or otherwise has a positive economic effect on the small entities subject to the rule. This action will not impose emission measurement requirements beyond those specified in the current regulations, nor does it change any emission standard. We have, therefore, concluded that this action will have no net regulatory burden for all directly regulated small entities.

E. Unfunded Mandates Reform Act (UMRA)

This action does not contain any unfunded mandate as described in UMRA, 2 U.S.C. 1531-1538, and does not significantly or uniquely affect small governments. The action imposes no enforceable duty on any state, local or tribal governments or the private sector.

F. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.

G. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175. This action simply corrects and updates existing testing regulations. Thus, Executive Order 13175 does not apply to this action.

H. Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks

The EPA interprets Executive Order 13045 as applying only to those regulatory actions that concern environmental health or safety risks that the EPA has reason to believe may disproportionately affect children, per the definition of “covered regulatory action” in section 2-202 of the Executive Order. This action is not subject to Executive Order 13045 because it does not concern an environmental health risk or safety risk.

I. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution or Use

This action is not subject to Executive Order 13211, because it is not a significant regulatory action under Executive Order 12866.

J. National Technology Transfer and Advancement Act (NTTAA) and 1 CFR Part 51

This action involves technical standards. The EPA used ASTM D 2369 in Method 24. The ASTM D 2369 standard covers volatile content of coatings. The EPA used (but is not incorporating by reference) ASTM D 4457, ASTM D 4827, and ASTM D 5910 in Method 311. These ASTM standards cover procedures to identify and quantify hazardous air pollutants in paints and coatings. The EPA used ASTM D 5623 and ASTM D 7039 in subpart KKKK of Part 60. The ASTM D 5623 standard covers the determination of sulfur compounds in light petroleum liquids, and the ASTM D 7039 standard covers the determination of sulfur in gasoline and diesel fuel. The ASTM standards were developed and adopted by the American Society for Testing and Materials and may be obtained from <http://www.astm.org> or from the ASTM at 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

The EPA used SW-846-6010D and SW-846-6020B in Method 12. Method SW-846-6010D covers inductively coupled plasma-atomic emission spectrometry (ICP-AES) analysis, and Method SW-846-6020B covers inductively coupled plasma-mass spectrometry (ICP-MS) analysis. These standards were developed and adopted by the Environmental Protection Agency and may be obtained from <http://www.epa.gov> or from the U.S. Environmental Protection Agency at 1200 Pennsylvania Avenue NW, Washington, DC 20460.

The EPA used API Manual of Petroleum Measurement Standards, Chapter 14-Natural Gas Fluids Measurement (Section 1) in Subpart KKKK of Part 60. This API standard involves the collecting and handling of natural gas samples for custody transfer. This API standard was developed and adopted by the American Petroleum Institute and may be obtained from <https://www.api.org/> or from the American Petroleum Institute at 1220 L Street NW., Washington, DC 20005.

The EPA used GPA 2166 in Subpart KKKK of Part 60, which involves procedures for obtaining samples from gaseous fuels. The EPA used GPA 2174 in Subpart KKKK of Part 60, which involves procedures for obtaining samples from liquid fuels. The EPA used GPA 2140 in subpart KKKK of Part 60, which involves liquefied petroleum gas specifications and test methods. The EPA used GPA 2261 in subpart KKKK of Part 60, which is a procedure for analyzing natural gas and similar gaseous mixtures. These GPA standards were developed and adopted by the GPA Midstream Association and may be obtained from <https://www.gpamidstream.org/> or from the GPA Midstream Association, Sixty Sixty American Plaza, Suite 700, Tulsa, OK 74135.

The EPA used ISO 10715 in subpart KKKK of Part 60. This standard involves procedures for obtaining samples from gaseous fuels. This standard was developed by the International Organization for Standardization and may be obtained from <https://www.iso.org/home.html> or from the ISH Inc., 15 Inverness Way East, Englewood, CO 80112.

Multiple ASTM and GPA standards were previously approved on July 6, 2006, and are already included in the regulatory text. Therefore, the current the IBR is unchanged in this rule for the following methods: ASTM D129-00, ASTM D1072-90 (Reapproved 1999); ASTM D1266-98 (Reapproved 2003)ε,1; ASTM D1552-03, ASTM D2622-05, ASTM D3246-05, ASTM D4057-95 (Reapproved 2000), ASTM D4084-05, ASTM D4177-95 (Reapproved 2000); ASTM D4294-03, ASTM D4468-85 (Reapproved 2000); ASTM D4810-88 (Reapproved 1999); ASTM D5287-97 (Reapproved 2002); ASTM D5453-05, ASTM D6228-98 (Reapproved 2003); ASTM D6667-04, and GPA 2377-86.

K. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

The EPA believes that this action is not subject to Executive Order 12898 (59 FR 7629, February 16, 1994) because it does not establish an environmental health or safety standard. This action is a technical correction to previously promulgated regulatory actions and does not have an impact on human health or the environment.

L. *Congressional Review Act (CRA)*

This action is subject to the CRA, and the EPA will submit a rule report to each house of the Congress and to the Comptroller General of the United States. This action is not a “major rule” as defined by 5 U.S.C. 804(2).

List of Subjects

40 CFR Part 51

Environmental protection, Air pollution control, Performance specifications, Test methods and procedures.

40 CFR Part 60

Environmental protection, Air pollution control, Incorporation by reference, Performance specifications, Test methods and procedures.

40 CFR Parts 61 and 63

Environmental protection, Air pollution control, Incorporation by reference, Performance specifications, Test methods and procedures.

Andrew Wheeler,
Administrator.

For the reasons set forth in the preamble, the EPA amends 40 CFR parts 51, 60, 61, and 63 as follows:

PART 51—REQUIREMENTS FOR PREPARATION, ADOPTION, AND SUBMITTAL OF IMPLEMENTATION PLANS

1. The authority citation for part 51 continues to read as follows:

Authority: 23 U.S.C. 101; 42 U.S.C. 7401-7671q.

2. In appendix M to part 51, in Method 201A, revise sections “1.2”, “1.6”, “6.2.1(d)”, and “8.6.6” and “Figure 7” to read as follows:

Appendix M to Part 51-Recommended Test Methods for State Implementation Plans

* * * * *

METHOD 201A—DETERMINATION OF PM₁₀ AND PM_{2.5} EMISSIONS FROM STATIONARY SOURCES (CONSTANT SAMPLING RATE PROCEDURE)

* * * * *

1.2 *Applicability.* This method addresses the equipment, preparation, and analysis necessary to measure filterable PM. You can use this method to measure filterable PM from stationary sources only. Filterable PM is collected in stack with this method (*i.e.*, the method measures materials that are solid or liquid at stack conditions). If the gas filtration temperature exceeds 29.4 °C (85 °F), then you may use the procedures in this method to measure only filterable PM (material that does not pass through a filter or a cyclone/filter combination). If the gas filtration temperature exceeds 29.4 °C (85 °F), and you must measure both the filterable and condensable (material that condenses after passing through a filter) components of total primary (direct) PM emissions to the atmosphere, then you must combine the procedures in this method with the procedures in Method 202 of appendix M to this part for measuring

condensable PM. However, if the gas filtration temperature never exceeds 29.4 °C (85 °F), then use of Method 202 of appendix M to this part is not required to measure total primary PM.

* * * * *

1.6 *Conditions*. You can use this method to obtain particle sizing at 10 micrometers and or 2.5 micrometers if you sample within 80 and 120 percent of isokinetic flow. You can also use this method to obtain total filterable particulate if you sample within 90 to 110 percent of isokinetic flow, the number of sampling points is the same as required by Method 5 of appendix A-3 to part 60 or Method 17 of appendix A-6 to part 60, and the filter temperature is within an acceptable range for these methods. For Method 5, the acceptable range for the filter temperature is generally 120 °C (248 °F) unless a higher or lower temperature is specified. The acceptable range varies depending on the source, control technology and applicable rule or permit condition. To satisfy Method 5 criteria, you may need to remove the in-stack filter and use an out-of-stack filter and recover the PM in the probe between the PM_{2.5} particle sizer and the filter. In addition, to satisfy Method 5 and Method 17 criteria, you may need to sample from more than 12 traverse points. Be aware that this method determines in-stack PM₁₀ and PM_{2.5} filterable emissions by sampling from a required maximum of 12 sample points, at a constant flow rate through the train (the constant flow is necessary to maintain the size cuts of the cyclones), and with a filter that is at the stack temperature. In contrast, Method 5 or Method 17 trains are operated isokinetically with varying flow rates through the train. Method 5 and Method 17 require sampling from as many as 24 sample points. Method 5 uses an out-of-stack filter that is maintained at a constant temperature of 120 °C (248 °F). Further, to use this method in place of Method 5 or Method 17, you must extend the sampling time so that you collect the minimum mass necessary for weighing each portion of this sampling train. Also, if you are using this method as an alternative to a test method specified in a regulatory requirement (e.g., a requirement to conduct a compliance or performance test),

then you must receive approval from the authority that established the regulatory requirement before you conduct the test.

* * * * *

6.2.1 * * *

(d) Petri dishes. For filter samples; glass, polystyrene, or polyethylene, unless otherwise specified by the Administrator.

* * * * *

8.6.6 *Sampling Head*. You must preheat the combined sampling head to the stack temperature of the gas stream at the test location (± 28 °C, ± 50 °F). This will heat the sampling head and prevent moisture from condensing from the sample gas stream.

* * * * *

17.0 * * *

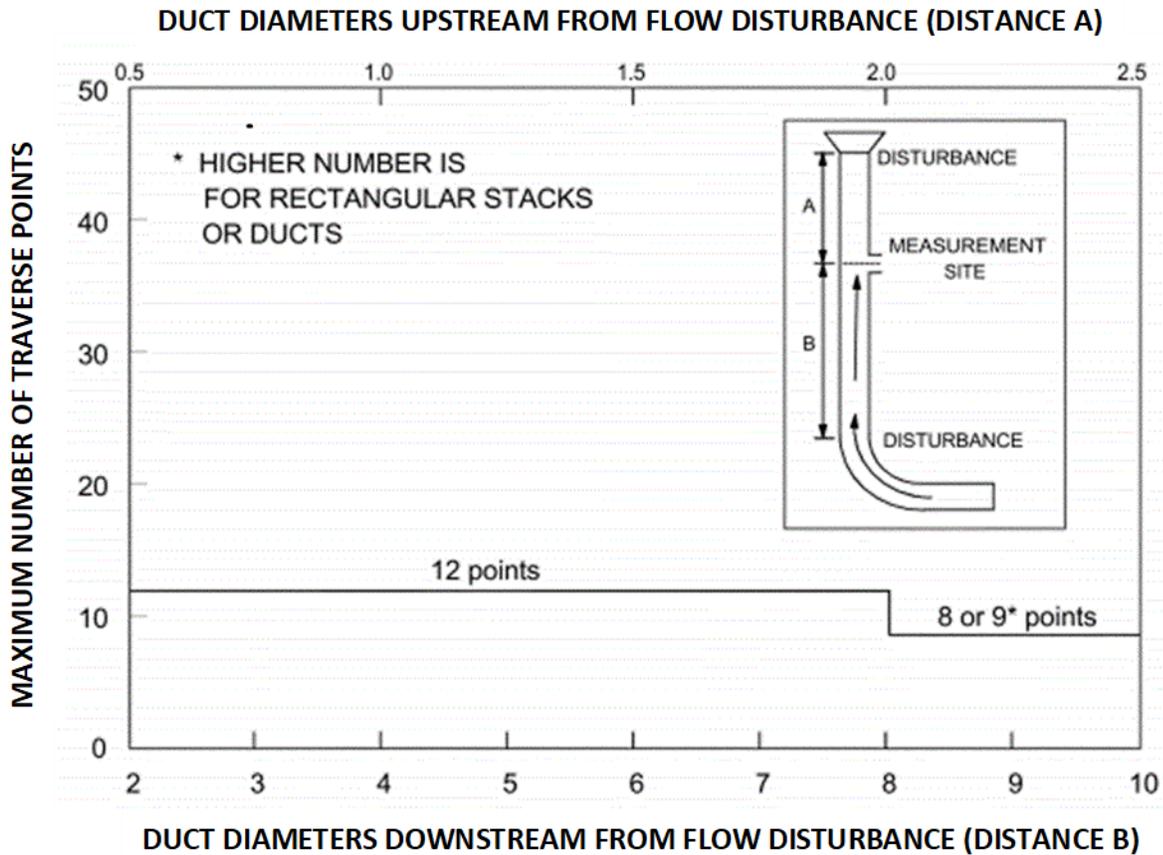


Figure 7. Maximum Number of Required Traverse Points

PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

3. The authority citation for part 60 continues to read as follows:

Authority: 42 U.S.C. 7401 et seq.

4. Amend § 60.17 by:

- a. Removing the text “appendix A-8 to part 60: Method 24,” and add in its place, “appendix A-7 to part 60: Method 24,” everywhere it appears;
- b. Revising the last sentence in paragraph (a);
- c. Redesignating paragraph (e)(2) as (e)(3) and adding a new paragraph (e)(2);
- d. Redesignating paragraphs (h)(192) through (209) as (h)(195) through (212), (h)(174) through (191) as (h)(176) through (193), and (h)(95) through (173) as (h)(96) through (174), respectively;
- e. Adding new paragraphs (h)(95), (175), and (194);
- f. Adding paragraphs (j)(3) and (4);
- g. Revising paragraph (k) introductory text;
- h. Redesignating paragraphs (k)(2) and (3) as paragraphs (k)(5) and (6) and redesignating paragraph (k)(1) as paragraph (k)(3), respectively;
- i. Adding new paragraphs (k)(1), (2), and (4);
- j. Revising newly redesignated paragraph (k)(5); and
- k. Adding paragraph (l)(2).

The revisions and additions read as follows:

§ 60.17 Incorporations by reference.

(a) * * * For information on the availability of this material at NARA, email fedreg.legal@nara.gov, or go to www.archives.gov/federal-register/cfr/ibr-locations.html.

* * * * *

(e) * * *

(2) API Manual of Petroleum Measurement Standards, Chapter 14-Natural Gas Fluids Measurement, Section 1-Collecting and Handling of Natural Gas Samples for Custody Transfer, 7th Edition, May 2016, IBR approved for §60.4415(a).

* * * * *

(h) * * *

(95) ASTM D2369-10 (Reapproved 2015)e1, Standard Test Method for Volatile Content of Coatings, (Approved June 1, 2015); IBR approved for appendix A-7 to part 60: Method 24, Section 6.2.

* * * * *

(175) ASTM D5623–19, Standard Test Method for Sulfur Compounds in Light Petroleum Liquids by Gas Chromatography and Sulfur Selective Detection, (Approved July 1, 2019); IBR approved for §60.4415(a).

* * * * *

(194) ASTM D7039–15a, Standard Test Method for Sulfur in Gasoline, Diesel Fuel, Jet Fuel, Kerosine, Boideisel, Biodiesel Blends, and Gasoline-Ethanol Blends by Monochromatic Wavelength Dispersive X-ray Fluorescence Spectrometry, (Approved July 1, 2015); IBR approved for §60.4415(a).

* * * * *

(j) * * *

(3) SW-846-6010D, Inductively Coupled Plasma-Optical Emission Spectrometry, Revision 5, July 2018,

in EPA Publication No. SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Third Edition, IBR approved for appendix A-5 to Part 60: Method 12.

(4) SW-846-6020B, Inductively Coupled Plasma-Mass Spectrometry, Revision 2, July 2014, in EPA Publication No. SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Third Edition, IBR approved for appendix A-5 to Part 60: Method 12.

(k) GPA Midstream Association (formerly known as Gas Processors Association), Sixty Sixty American Plaza, Suite 700, Tulsa, OK 74135.

Note 1 to paragraph (k): Material in this paragraph that is no longer available from GPA may be available through the reseller HIS Markit, 15 Inverness Way East, PO Box 1154, Englewood, CO 80150-1154, <https://global.ihs.com/>. For material that is out-of-print, contact EPA's Air and Radiation Docket and Information Center, Room 3334, 1301 Constitution Ave. NW., Washington, DC 20460 or and-r docket @epa.gov.

(1) GPA Midstream Standard 2140–17 (GPA 2140-17), Liquefied Petroleum Gas Specifications and Test Methods, (Revised 2017), IBR approved for §60.4415(a).

(2) GPA Midstream Standard 2166-17 (GPA 2166-17), Obtaining Natural Gas Samples for Analysis by Gas Chromatography, (Reaffirmed 2017), IBR approved for §60.4415(a).

* * * * *

(4) GPA Standard 2174-14 (GPA 2174-14), Obtaining Liquid Hydrocarbon Samples for Analysis by Gas Chromatography, (Revised 2014), IBR approved for §60.4415(a).

(5) GPA Standard 2261–19 (GPA 2261-19), Analysis for Natural Gas and Similar Gaseous Mixtures by Gas Chromatography, (Revised 2019), IBR approved for §60.4415(a).

* * * * *

(1) * * *

(2) ISO 10715:1997(E), Natural gas—Sampling guidelines, (First Edition, June 1, 1997), IBR approved for §60.4415(a)

* * * * *

Subpart AAA—Standards of Performance for New Residential Wood Heaters

5. Amend § 60.534 by revising paragraph (h) to read as follows:

§ 60.534 What test methods and procedures must I use to determine compliance with the standards and requirements for certification?

* * * * *

(h) The approved test laboratory must allow the manufacturer, the manufacturer’s approved third-party certifier, the EPA and delegated state regulatory agencies to observe certification testing. However, manufacturers must not involve themselves in the conduct of the test after the pretest burn has begun. Communications between the manufacturer and laboratory or third-party certifier personnel regarding operation of the wood heater must be limited to written communications transmitted prior to the first pretest burn of the certification test series. During certification tests, the manufacturer may communicate with the third-party certifier, and only in writing, to notify them that the manufacturer has observed a deviation from proper test procedures by the laboratory. All communications must be included in the test documentation required to be submitted pursuant to §60.533(b)(5) and must be consistent with instructions provided in the owner’s manual required under §60.536(g).

Subpart XXX—Standards of Performance for Municipal Solid Waste Landfills That Commenced Construction, Reconstruction, or Modification After July 17, 2014

6. Amend § 60.766 by revising paragraph (a)(3) to read as follows:

§ 60.766 Monitoring of operations.

* * * * *

(a) * * *

(3) Monitor temperature of the landfill gas on a monthly basis as provided in 60.765(a)(5). The temperature measuring device must be calibrated annually using the procedure in 40 CFR part 60, appendix A-1, Method 2, Section 10.3 such that a minimum of two temperature points, bracket within 10 percent of all landfill absolute temperature measurements or two fixed points of ice bath and boiling water, corrected for barometric pressure, are used.

* * * * *

Subpart CCCC—Standards of Performance for Commercial and Industrial Solid Waste

Incineration Units

7. Amend § 60.2110 by revising paragraphs (i) introductory text, (i)(1), and (i)(2) introductory text to read as follows:

§ 60.2110 What operating limits must I meet and by when?

* * * * *

(i) If you use a PM CPMS to demonstrate continuing compliance, you must establish your PM CPMS operating limit and determine compliance with it according to paragraphs (i)(1) through (5) of this section:

(1) Determine your operating limit as the average PM CPMS output value recorded during the performance test or at a PM CPMS output value corresponding to 75 percent of the emission limit if your PM performance test demonstrates compliance below 75 percent of the emission limit. You must verify an existing or establish a new operating limit after each repeated performance test. You must repeat the performance test annually and reassess and adjust the site-specific operating limit in accordance with the results of the performance test:

(i) Your PM CPMS must provide a 4-20 milliamp output, or digital equivalent, and the establishment of its relationship to manual reference method measurements must be determined in units of milliamps;

(ii) Your PM CPMS operating range must be capable of reading PM concentrations from zero to a level equivalent to at least two times your allowable emission limit. If your PM CPMS is an auto-ranging instrument capable of multiple scales, the primary range of the instrument must be capable of reading PM concentration from zero to a level equivalent to two times your allowable emission limit; and

(iii) During the initial performance test or any such subsequent performance test that demonstrates compliance with the PM limit, record and average all milliamp output values, or their digital equivalent, from the PM CPMS for the periods corresponding to the compliance test runs (e.g., average all your PM CPMS output values for three corresponding Method 5 or Method 29 test runs).

(2) If the average of your three PM performance test runs are below 75 percent of your PM emissions limit, you must calculate an operating limit by establishing a relationship of PM CPMS signal to PM concentration using the PM CPMS instrument zero, the average PM CPMS output values corresponding to the three compliance test runs, and the average PM concentration from the Method 5 or Method 29 performance test with the procedures in (i)(1) through (5) of this section:

* * * * *

8. Amend § 60.2145 by revising paragraphs (j) introductory text and (y)(3) to read as follows:

§ 60.2145 How do I demonstrate continuous compliance with the emission limitations and the operating limits?

* * * * *

(j) For waste-burning kilns, you must conduct an annual performance test for particulate matter, cadmium, lead, carbon monoxide, dioxins/furans and hydrogen chloride as listed in Table 7 of this subpart, unless you choose to demonstrate initial and continuous compliance using CEMS, as allowed in paragraph (u) of this section. If you do not use an acid gas wet scrubber or dry scrubber, you must determine compliance with the hydrogen chloride emissions limit using a HCl CEMS according to the requirements in paragraph (j)(1) of this section. You must determine compliance with the mercury emissions limit using a mercury CEMS or an integrated sorbent trap monitoring system according to paragraph (j)(2) of this section. You must determine compliance with nitrogen oxides and sulfur dioxide using CEMS. You must determine continuing compliance with the particulate matter emissions limit using a PM CPMS according to paragraph (x) of this section.

* * * * *

(y) * * *

(3) For purposes of determining the combined emissions from kilns equipped with an alkali bypass or that exhaust kiln gases to a coal mill that exhausts through a separate stack, instead of installing a CEMS or PM CPMS on the alkali bypass stack or in-line coal mill stack, the results of the initial and subsequent performance test can be used to demonstrate compliance with the relevant emissions limit. A performance test must be conducted on an annual basis (no later than 13 calendar months following the previous performance test).

9. Revise § 60.2150 to read as follows:

§ 60.2150 By what date must I conduct the annual performance test?

You must conduct annual performance tests no later than 13 calendar months following the previous performance test.

10. Amend § 60.2210 by revising the introductory text and adding paragraph (p) to read as follows:

§ 60.2210 What information must I include in my annual report?

The annual report required under §60.2205 must include the items listed in paragraphs (a) through (p) of this section. If you have a deviation from the operating limits or the emission limitations, you must also submit deviation reports as specified in §§ 60.2215, 60.2220, and 60.2225:

* * * * *

(p) For energy recovery units, include the annual heat input and average annual heat input rate of all fuels being burned in the unit to verify which subcategory of energy recovery unit applies.

11. Table 6 to subpart CCCC of part 60 is revised to read as follows:

Table 6 to Subpart CCCC of Part 60—Emission Limitations for Energy Recovery Units That Commenced Construction After June 4, 2010, or That Commenced Reconstruction or Modification After August 7, 2013

For the air pollutant	You must meet this emission limitation ¹		Using this averaging time ²	And determining compliance using this method ²
	Liquid/gas	Solids		
Cadmium	0.023 milligrams per dry standard cubic meter	Biomass-0.0014 milligrams per dry standard cubic meter. Coal-0.0017 milligrams per dry standard cubic meter	3-run average (collect a minimum volume of 4 dry standard cubic meters per run)	Performance test (Method 29 at 40 CFR part 60, appendix A-8). Use ICPMS for the analytical finish.
Carbon monoxide	35 parts per million dry volume	Biomass-240 parts per million dry volume	3-run average (1 hour minimum sample time per run)	Performance test (Method 10 at 40 CFR part 60, appendix A-4).

For the air pollutant	You must meet this emission limitation ¹		Using this averaging time ²	And determining compliance using this method ²
	Liquid/gas	Solids		
		Coal-95 parts per million dry volume		
Dioxin/furans (Total Mass Basis)	No Total Mass Basis limit, must meet the toxic equivalency basis limit below	Biomass-0.52 nanograms per dry standard cubic meter. Coal-5.1 nanograms per dry standard cubic meter.	3-run average (collect a minimum volume of 4 dry standard cubic meters)	Performance test (Method 23 at 40 CFR part 60, appendix A-7).
Dioxins/furans (toxic equivalency basis)	0.093 nanograms per dry standard cubic meter.	Biomass-0.076 nanograms per dry standard cubic meter. ³ Coal-0.075 nanograms per dry standard cubic meter.	3-run average (collect a minimum volume of 4 dry standard cubic meters per run)	Performance test (Method 23 of appendix A-7 of this part).
Fugitive ash	Visible emissions for no more than 5 percent of the hourly observation period	Three 1-hour observation periods	Visible emission test (Method 22 at 40 CFR part 60, appendix A-7).	Fugitive ash
Hydrogen chloride	14 parts per million dry volume	Biomass-0.20 parts per million dry volume Coal-58 parts per million dry volume	3-run average (For Method 26, collect a minimum volume of 360 liters per run. For Method 26A, collect a minimum volume of 3 dry standard cubic meters per run)	Performance test (Method 26 or 26A at 40 CFR part 60, appendix A-8).
Lead	0.096 milligrams per dry standard cubic meter	Biomass-0.014 milligrams per dry standard cubic meter. Coal-0.057	3-run average (collect a minimum volume of 4 dry standard	Performance test (Method 29 at 40 CFR part 60, appendix A-8). Use ICPMS for the analytical finish.

For the air pollutant	You must meet this emission limitation ¹		Using this averaging time ²	And determining compliance using this method ²
	Liquid/gas	Solids		
		milligrams per dry standard cubic meter.	cubic meters per run)	
Mercury	0.00056 milligrams per dry standard cubic meter.	Biomass-0.0022 milligrams per dry standard cubic meter Coal-0.013 milligrams per dry standard cubic meter	3-run average (collect enough volume to meet an in-stack detection limit data quality objective of 0.03 ug/dscm)	Performance test (Method 29 or 30B at 40 CFR part 60, appendix A-8) or ASTM D6784-02 (Reapproved 2008). ³
Nitrogen oxides	76 parts per million dry volume	Biomass-290 parts per million dry volume Coal-460 parts per million dry volume	3-run average (for Method 7E, 1 hour minimum sample time per run)	Performance test (Method 7 or 7E at 40 CFR part 60, appendix A-4).
Particulate matter (filterable)	110 milligrams per dry standard cubic meter	Biomass-5.1 milligrams per dry standard cubic meter Coal-130 milligrams per dry standard cubic meter	3-run average (collect a minimum volume of 1 dry standard cubic meter per run)	Performance test (Method 5 or 29 at 40 CFR part 60, appendix A-3 or appendix A-8).
Sulfur dioxide	720 parts per million dry volume	Biomass-7.3 parts per million dry volume Coal-850 parts per million dry volume	3-run average (for Method 6, collect a minimum of 60 liters, for Method 6C, 1 hour minimum sample time per run)	Performance test (Method 6 or 6C at 40 CFR part 60, appendix A-4).

¹ All emission limitations are measured at 7 percent oxygen, dry basis at standard conditions. For dioxins/furans, you must meet either the Total Mass Basis limit or the toxic equivalency basis limit.

² In lieu of performance testing, you may use a CEMS or, for mercury, an integrated sorbent trap monitoring system to demonstrate initial and continuing compliance with an emissions limit, as long as you comply with the CEMS or integrated sorbent trap monitoring system requirements applicable to the specific pollutant in §§ 60.2145 and 60.2165. As prescribed in §60.2145(u), if you use a CEMS or an integrated sorbent trap monitoring system to demonstrate compliance with an emissions limit, your averaging time is a 30-day rolling average of 1-hour arithmetic average emission concentrations.

³ Incorporated by reference, *see* §60.17.

12. Table 7 to subpart CCCC of part 60 is revised to read as follows:

Table 7 to Subpart CCCC of Part 60—Emission Limitations for Waste-burning Kilns That Commenced Construction After June 4, 2010, or Reconstruction or Modification After August 7, 2013

For the air pollutant	You must meet this emission limitation¹	Using this averaging time²	And determining compliance using this method^{2,3}
Cadmium	0.0014 milligrams per dry standard cubic meter.	3-run average (collect a minimum volume of 4 dry standard cubic meters per run)	Performance test (Method 29 at 40 CFR part 60, appendix A-8). Use ICPMS for the analytical finish.
Carbon monoxide	90 (long kilns)/190 (preheater/precalciner) parts per million dry volume	3-run average (1 hour minimum sample time per run)	Performance test (Method 10 at 40 CFR part 60, appendix A-4).
Dioxins/furans (total mass basis)	0.51 nanograms per dry standard cubic meter.	3-run average (collect a minimum volume of 4 dry standard cubic meters per run)	Performance test (Method 23 at 40 CFR part 60, appendix A-7).
Dioxins/furans (toxic equivalency basis)	0.075 nanograms per dry standard cubic meter.	3-run average (collect a minimum volume of 4 dry standard cubic meters)	Performance test (Method 23 at 40 CFR part 60, appendix A-7).
Hydrogen chloride	3.0 parts per million dry volume.	3-run average (1 hour minimum sample time per run) or 30-day rolling average if HCl CEMS is being used	If a wet scrubber or dry scrubber is used, performance test (Method 321 at 40 CFR part 63, appendix A). If a wet scrubber or dry scrubber is not used, HCl CEMS as specified in § 60.2145(j).
Lead	0.014 milligrams per dry standard cubic meter.	3-run average (collect a minimum volume of 4 dry standard cubic meters)	Performance test (Method 29 at 40 CFR part 60, appendix A-8). Use ICPMS for the analytical finish.
Mercury	0.0037 milligrams per dry standard cubic meter Or 21 pounds/million tons of clinker ³	30-day rolling average	Mercury CEMS or integrated sorbent trap monitoring system (performance specification 12A or 12B, respectively, of appendix B and procedure 5 of appendix F of this part), as specified in § 60.2145(j).
Nitrogen oxides	200 parts per million dry volume	30-day rolling average	Nitrogen oxides CEMS (performance specification 2

For the air pollutant	You must meet this emission limitation¹	Using this averaging time²	And determining compliance using this method^{2,3}
			of appendix B and procedure 1 of appendix F of this part).
Particulate matter (filterable)	4.9 milligrams per dry standard cubic meter	3-run average (collect a minimum volume of 2 dry standard cubic meters)	Performance test (Method 5 or 29 at 40 CFR part 60, appendix A-3 or appendix-8).
Sulfur dioxide	28 parts per million dry volume	30-day rolling average	Sulfur dioxide CEMS (performance specification 2 of appendix B and procedure 1 of appendix F of this part).

- ¹ All emission limitations are measured at 7 percent oxygen (except for CEMS and integrated sorbent trap monitoring system data during startup and shutdown), dry basis at standard conditions. For dioxins/furans, you must meet either the Total Mass Basis limit or the toxic equivalency basis limit.
- ² In lieu of performance testing, you may use a CEMS or, for mercury, an integrated sorbent trap monitoring system, to demonstrate initial and continuing compliance with an emissions limit, as long as you comply with the CEMS or integrated sorbent trap monitoring system requirements applicable to the specific pollutant in §§ 60.2145 and 60.2165. As prescribed in §60.2145(u), if you use a CEMS or integrated sorbent trap monitoring system to demonstrate compliance with an emissions limit, your averaging time is a 30-day rolling average of 1-hour arithmetic average emission concentrations.
- ³ Alkali bypass and in-line coal mill stacks are subject to performance testing only, as specified in §60.2145(y)(3). They are not subject to the CEMS, integrated sorbent trap monitoring system, or CPMS requirements that otherwise may apply to the main kiln exhaust.

Subpart DDDD-Emission Guidelines and Compliance Times for Commercial and Industrial Solid Waste Incineration Units

13. Amend § 60.2675 by revising the introductory text to paragraphs (i) introductory text, (i)(1), and (i)(2) introductory text to read as follows:

§ 60.2675 What operating limits must I meet and by when?

* * * * *

(i) If you use a PM CPMS to demonstrate continuing compliance, you must establish your PM CPMS operating limit and determine compliance with it according to paragraphs (i)(1) through (5) of this section:

(1) During the initial performance test or any such subsequent performance test that demonstrates compliance with the PM limit, record all hourly average output values (milliamps, or the digital signal equivalent) from the PM CPMS for the periods corresponding to the test runs (*e.g.*, three 1-hour average PM CPMS output values for three 1-hour test runs):

(i) Your PM CPMS must provide a 4-20 milliamp output, or the digital signal equivalent, and the establishment of its relationship to manual reference method measurements must be determined in units of milliamps or digital bits;

(ii) Your PM CPMS operating range must be capable of reading PM concentrations from zero to a level equivalent to at least two times your allowable emission limit. If your PM CPMS is an auto-ranging instrument capable of multiple scales, the primary range of the instrument must be capable of reading PM concentration from zero to a level equivalent to two times your allowable emission limit; and

(iii) During the initial performance test or any such subsequent performance test that demonstrates compliance with the PM limit, record and average all milliamp output values, or their digital equivalent, from the PM CPMS for the periods corresponding to the compliance test runs (*e.g.*, average all your PM CPMS output values for the three corresponding Method 5 or Method 29 PM test runs).

(2) If the average of your three PM performance test runs are below 75 percent of your PM emission limit, you must calculate an operating limit by establishing a relationship of PM CPMS signal to PM concentration using the PM CPMS instrument zero, the average PM CPMS output values corresponding to the three compliance test runs, and the average PM concentration from the Method 5 or Method 29 performance test with the procedures in (i)(1)through (5) of this section:

* * * * *

14. Amend § 60.2710 by revising paragraphs (j) introductory text and (y)(3) to read as follows:

§ 60.2710 How do I demonstrate continuous compliance with the amended emission limitations and the operating limits?

* * * * *

(j) For waste-burning kilns, you must conduct an annual performance test for the pollutants (except mercury and hydrogen chloride if no acid gas wet scrubber or dry scrubber is used) listed in Table 8 of this subpart, unless you choose to demonstrate initial and continuous compliance using CEMS, as allowed in paragraph (u) of this section. If you do not use an acid gas wet scrubber or dry scrubber, you must determine compliance with the hydrogen chloride emissions limit using a HCl CEMS according to the requirements in paragraph (j)(1) of this section. You must determine compliance with the mercury emissions limit using a mercury CEMS or an integrated sorbent trap monitoring system according to paragraph (j)(2) of this section. You must determine continuing compliance with particulate matter using a PM CPMS according to paragraph (x) of this section.

* * * * *

(y) * * *

(3) For purposes of determining the combined emissions from kilns equipped with an alkali bypass or that exhaust kiln gases to a coal mill that exhausts through a separate stack, instead of installing a CEMS or PM CPMS on the alkali bypass stack or in-line coal mill stack, the results of the initial and subsequent performance test can be used to demonstrate compliance with the relevant emissions limit. A performance test must be conducted on an annual basis (no later than 13 calendar months following the previous performance test).

15. Revise § 60.2715 to read as follows:

§ 60.2715 By what date must I conduct the annual performance test?

You must conduct annual performance tests no later than 13 calendar months following the previous performance test.

16. Table 7 to subpart DDDD of part 60 is revised to read as follows:

Table 7 to Subpart DDDD of Part 60—Model Rule—Emission Limitations That Apply to Energy Recovery Units After May 20, 2011 [Date to be specified in state plan]¹

For the air pollutant	You must meet this emission limitation ²		Using this averaging time ³	And determining compliance using this method ³
	Liquid/Gas	Solids		
Cadmium	0.023 milligrams per dry standard cubic meter	Biomass-0.0014 milligrams per dry standard cubic meter. Coal-0.0017 milligrams per dry standard cubic meter.	3-run average (collect a minimum volume of 2 dry standard cubic meters)	Performance test (Method 29 at 40 CFR part 60, appendix A-8). Use ICPMS for the analytical finish.
Carbon monoxide	35 parts per million dry volume	Biomass-260 parts per million dry volume Coal-95 parts per million dry volume	3-run average (1 hour minimum sample time per run)	Performance test (Method 10 at 40 CFR part 60, appendix A-4).
Dioxins/furans (total mass basis)	2.9 nanograms per dry standard cubic meter	Biomass-0.52 nanograms per dry standard cubic meter. Coal-5.1 nanograms per dry standard cubic meter.	3-run average (collect a minimum volume of 4 dry standard cubic meter)	Performance test (Method 23 at 40 CFR part 60, appendix A-7).

For the air pollutant	You must meet this emission limitation ²		Using this averaging time ³	And determining compliance using this method ³
	Liquid/Gas	Solids		
Dioxins/furans (toxic equivalency basis)	0.32 nanograms per dry standard cubic meter	Biomass-0.12 nanograms per dry standard cubic meter Coal-0.075 nanograms per dry standard cubic meter.	3-run average (collect a minimum volume of 4 dry standard cubic meters)	Performance test (Method 23 at 40 CFR part 60, appendix A-7).
Hydrogen chloride	14 parts per million dry volume	Biomass-0.20 parts per million dry volume Coal-58 parts per million dry volume	3-run average (for Method 26, collect a minimum of 120 liters; for Method 26A, collect a minimum volume of 1 dry standard cubic meter)	Performance test (Method 26 or 26A at 40 CFR part 60, appendix A-8).
Lead	0.096 milligrams per dry standard cubic meter	Biomass-0.014 milligrams per dry standard cubic meter. Coal-0.057 milligrams per dry standard cubic meter.	3-run average (collect a minimum volume of 2 dry standard cubic meters)	Performance test (Method 29 at 40 CFR part 60, appendix A-8). Use ICPMS for the analytical finish.
Mercury	0.0024 milligrams per dry standard cubic meter	Biomass-0.0022 milligrams per dry standard cubic meter Coal-0.013 milligrams per dry standard cubic meter	3-run average (For Method 29 and ASTM D6784-02 (Reapproved 2008) ⁴ , collect a minimum volume of 2 dry standard cubic meters per run. For Method 30B, collect a minimum sample as specified in Method 30B at 40 CFR part 60, appendix A)	Performance test (Method 29 or 30B at 40 CFR part 60, appendix A-8) or ASTM D6784-02 (Reapproved 2008). ⁴

For the air pollutant	You must meet this emission limitation ²		Using this averaging time ³	And determining compliance using this method ³
	Liquid/Gas	Solids		
Nitrogen oxides	76 parts per million dry volume	Biomass-290 parts per million dry volume Coal-460 parts per million dry volume	3-run average (for Method 7E, 1 hour minimum sample time per run)	Performance test (Method 7 or 7E at 40 CFR part 60, appendix A-4).
Particulate matter filterable	110 milligrams per dry standard cubic meter	Biomass-11 milligrams per dry standard cubic meter Coal-130 milligrams per dry standard cubic meter	3-run average (collect a minimum volume of 1 dry standard cubic meter)	Performance test (Method 5 or 29 at 40 CFR part 60, appendix A-3 or appendix A-8).
Sulfur dioxide	720 parts per million dry volume	Biomass-7.3 parts per million dry volume Coal-850 parts per million dry volume	3-run average (1 hour minimum sample time per run)	Performance test (Method 6 or 6c at 40 CFR part 60, appendix A-4).
Fugitive ash	Visible emissions for no more than 5 percent of the hourly observation period	Visible emissions for no more than 5 percent of the hourly observation period	Three 1-hour observation periods	Visible emission test (Method 22 at 40 CFR part 60, appendix A-7).

¹ The date specified in the state plan can be no later than 3 years after the effective date of approval of a revised state plan or February 7, 2018.

² All emission limitations (except for opacity) are measured at 7 percent oxygen, dry basis at standard conditions. For dioxins/furans, you must meet either the total mass basis limit or the toxic equivalency basis limit.

³ In lieu of performance testing, you may use a CEMS or, for mercury, an integrated sorbent trap monitoring system, to demonstrate initial and continuing compliance with an emissions limit, as long as you comply with the CEMS or integrated sorbent trap monitoring system requirements applicable to the specific pollutant in §§ 60.2710 and 60.2730. As prescribed in §60.2710(u), if you use a CEMS or integrated sorbent trap monitoring system to demonstrate compliance with an emissions limit, your averaging time is a 30-day rolling average of 1-hour arithmetic average emission concentrations.

⁴ Incorporated by reference, see §60.17.

17. Table 8 to subpart DDDD of part 60 is revised to read as follows:

Table 8 to Subpart DDDD of Part 60—Model Rule—Emission Limitations That Apply to Waste-Burning Kilns After May 20, 2011 [Date to be specified in state plan.]¹

For the air pollutant	You must meet this emission limitation²	Using this averaging time³	And determining compliance using this method^{3,4}
Cadmium	0.0014 milligrams per dry standard cubic meter.	3-run average (collect a minimum volume of 2 dry standard cubic meters)	Performance test (Method 29 at 40 CFR part 60, appendix A-8).
Carbon monoxide	110 (long kilns)/790 (preheater/precalciner) parts per million dry volume	3-run average (1 hour minimum sample time per run)	Performance test (Method 10 at 40 CFR part 60, appendix A-4).
Dioxins/furans (total mass basis)	1.3 nanograms per dry standard cubic meter.	3-run average (collect a minimum volume of 4 dry standard cubic meters)	Performance test (Method 23 at 40 CFR part 60, appendix A-7).
Dioxins/furans (toxic equivalency basis)	0.075 nanograms per dry standard cubic meter.	3-run average (collect a minimum volume of 4 dry standard cubic meters)	Performance test (Method 23 at 40 CFR part 60, appendix A-7).
Hydrogen chloride	3.0 parts per million dry volume.	3-run average (collect a minimum volume of 1 dry standard cubic meter), or 30-day rolling average if HCl CEMS is being used	If a wet scrubber or dry scrubber is used, performance test (Method 321 at 40 CFR part 63, appendix A of this part). If a wet scrubber or dry scrubber is not used, HCl CEMS as specified in § 60.2710(j).
Lead	0.014 milligrams per dry standard cubic meter.	3-run average (collect a minimum volume of 2 dry standard cubic meters)	Performance test (Method 29 at 40 CFR part 60, appendix A-8).
Mercury	0.011 milligrams per dry standard cubic meter Or 58 pounds/million tons of clinker	30-day rolling average	Mercury CEMS or integrated sorbent trap monitoring system (performance specification 12A or 12B, respectively, of appendix B and procedure 5 of appendix F of this part), as specified in § 60.2710(j).

For the air pollutant	You must meet this emission limitation²	Using this averaging time³	And determining compliance using this method^{3,4}
Nitrogen oxides	630 parts per million dry volume	3-run average (for Method 7E, 1 hour minimum sample time per run)	Performance test (Method 7 or 7E at 40 CFR part 60, appendix A-4).
Particulate matter filterable	13.5 milligrams per dry standard cubic meter	3-run average (collect a minimum volume of 1 dry standard cubic meter)	Performance test (Method 5 or 29 at 40 CFR part 60, appendix A-3 or appendix-8).
Sulfur dioxide	600 parts per million dry volume	3-run average (for Method 6, collect a minimum of 20 liters; for Method 6C, 1 hour minimum sample time per run)	Performance test (Method 6 or 6c at 40 CFR part 60, appendix A-4).

¹ The date specified in the state plan can be no later than 3 years after the effective date of approval of a revised state plan or February 7, 2018.

² All emission limitations are measured at 7 percent oxygen (except for CEMS and integrated sorbent trap monitoring system data during startup and shutdown), dry basis at standard conditions. For dioxins/furans, you must meet either the total mass basis limit or the toxic equivalency basis limit.

³ In lieu of performance testing, you may use a CEMS or, for mercury, an integrated sorbent trap monitoring system, to demonstrate initial and continuing compliance with an emissions limit, as long as you comply with the CEMS or integrated sorbent trap monitoring system requirements applicable to the specific pollutant in §§ 60.2710 and 60.2730. As prescribed in §60.2710(u), if you use a CEMS or integrated sorbent trap monitoring system to demonstrate compliance with an emissions limit, your averaging time is a 30-day rolling average of 1-hour arithmetic average emission concentrations.

⁴ Alkali bypass and in-line coal mill stacks are subject to performance testing only, as specified in §60.2710(y)(3). They are not subject to the CEMS, integrated sorbent trap monitoring system, or CPMS requirements that otherwise may apply to the main kiln exhaust.

Subpart JJJJ—Standards of Performance for Stationary Spark Ignition Internal Combustion

Engines

18. Table 2 to subpart JJJJ of part 60 is revised to read as follows:

As stated in §60.4244, you must comply with the following requirements for performance tests within 10 percent of 100 percent peak (or the highest achievable) load]

TABLE 2 TO SUBPART JJJJ OF PART 60-REQUIREMENTS FOR PERFORMANCE TESTS

For each	Complying with the requirement to	You must	Using	According to the following requirements
1. Stationary SI internal combustion engine demonstrating compliance according to §60.4244	a. Limit the concentration of NO _x in the stationary SI internal combustion engine exhaust	i. Select the sampling port location and the number/location of traverse points at the exhaust of the stationary internal combustion engine;	(1) Method 1 or 1A of 40 CFR part 60, appendix A-1, if measuring flow rate	(a) Alternatively, for NO _x , O ₂ , and moisture measurement, ducts ≤6 inches in diameter may be sampled at a single point located at the duct centroid and ducts >6 and ≤12 inches in diameter may be sampled at 3 traverse points located at 16.7, 50.0, and 83.3% of the measurement line ('3-point long line'). If the duct is >12 inches in diameter <i>and</i> the sampling port location meets the two and half-diameter criterion of Section 11.1.1 of Method 1 of 40 CFR part 60, Appendix A, the duct may be sampled at '3-point long line'; otherwise, conduct the stratification testing and select sampling points according to Section 8.1.2 of Method 7E of 40 CFR part 60, Appendix A.
		ii. Determine the O ₂ concentration of the stationary internal combustion engine exhaust at the sampling port location;	(2) Method 3, 3A, or 3B ^b of 40 CFR part 60, appendix A-2 or ASTM Method D6522-00 (Reapproved 2005) ^{ad}	(b) Measurements to determine O ₂ concentration must be made at the same time as the measurements for NO _x concentration.
		iii. If necessary, determine the exhaust flowrate of the stationary internal combustion engine exhaust;	(3) Method 2 or 2C of 40 CFR part 60, appendix A-1 or Method 19 of 40 CFR part 60, appendix A-7	(c) Measurements to determine the exhaust flowrate must be made (1) at the same time as the measurement for NO _x concentration or, alternatively (2) according to the option in Section 11.1.2 of Method 1A of 40 CFR part 60, Appendix A-1, if applicable.
		iv. If necessary, measure moisture content of the stationary internal combustion engine exhaust at the sampling port location; and	(4) Method 4 of 40 CFR part 60, appendix A-3, Method 320 of 40 CFR part 63, appendix A ^c , or ASTM Method D6348-03 ^{de}	(d) Measurements to determine moisture must be made at the same time as the measurement for NO _x concentration.

		v. Measure NO _x at the exhaust of the stationary internal combustion engine; if using a control device, the sampling site must be located at the outlet of the control device	(5) Method 7E of 40 CFR part 60, appendix A-4, ASTM Method D6522-00 (Reapproved 2005) ^{ad} , Method 320 of 40 CFR part 63, appendix A ^e , or ASTM Method D6348-03 ^{de}	(e) Results of this test consist of the average of the three 1-hour or longer runs.
	b. Limit the concentration of CO in the stationary SI internal combustion engine exhaust	i. Select the sampling port location and the number/location of traverse points at the exhaust of the stationary internal combustion engine;	(1) Method 1 or 1A of 40 CFR part 60, appendix A-1, if measuring flow rate	(a) Alternatively, for CO, O ₂ , and moisture measurement, ducts ≤6 inches in diameter may be sampled at a single point located at the duct centroid and ducts >6 and ≤12 inches in diameter may be sampled at 3 traverse points located at 16.7, 50.0, and 83.3% of the measurement line ('3-point long line'). If the duct is >12 inches in diameter <i>and</i> the sampling port location meets the two and half-diameter criterion of Section 11.1.1 of Method 1 of 40 CFR part 60, Appendix A, the duct may be sampled at '3-point long line'; otherwise, conduct the stratification testing and select sampling points according to Section 8.1.2 of Method 7E of 40 CFR part 60, Appendix A.
		ii. Determine the O ₂ concentration of the stationary internal combustion engine exhaust at the sampling port location;	(2) Method 3, 3A, or 3B ^b of 40 CFR part 60, appendix A-2 or ASTM Method D6522-00 (Reapproved 2005) ^{ad}	(b) Measurements to determine O ₂ concentration must be made at the same time as the measurements for CO concentration.
		iii. If necessary, determine the exhaust flowrate of the stationary internal combustion engine exhaust;	(3) Method 2 or 2C of 40 CFR 60, appendix A-1 or Method 19 of 40 CFR part 60, appendix A-7	(c) Measurements to determine the exhaust flowrate must be made (1) at the same time as the measurement for CO concentration or, alternatively (2) according to the option in Section 11.1.2 of Method 1A of 40 CFR part 60, Appendix A-1, if applicable.
		iv. If necessary, measure moisture	(4) Method 4 of 40 CFR part 60,	(d) Measurements to determine moisture must be made at the same

		content of the stationary internal combustion engine exhaust at the sampling port location; and	appendix A-3, Method 320 of 40 CFR part 63, appendix A ^e , or ASTM Method D6348-03 ^{de}	time as the measurement for CO concentration.
		v. Measure CO at the exhaust of the stationary internal combustion engine; if using a control device, the sampling site must be located at the outlet of the control device	(5) Method 10 of 40 CFR part 60, appendix A4, ASTM Method D6522-00 (Reapproved 2005) ^{ade} , Method 320 of 40 CFR part 63, appendix A ^e , or ASTM Method D6348-03 ^{de}	(e) Results of this test consist of the average of the three 1-hour or longer runs.
	c. Limit the concentration of VOC in the stationary SI internal combustion engine exhaust	i. Select the sampling port location and the number/location of traverse points at the exhaust of the stationary internal combustion engine;	(1) Method 1 or 1A of 40 CFR part 60, appendix A-1, if measuring flow rate	(a) Alternatively, for VOC, O ₂ , and moisture measurement, ducts ≤6 inches in diameter may be sampled at a single point located at the duct centroid and ducts >6 and ≤12 inches in diameter may be sampled at 3 traverse points located at 16.7, 50.0, and 83.3% of the measurement line ('3-point long line'). If the duct is >12 inches in diameter <i>and</i> the sampling port location meets the two and half-diameter criterion of Section 11.1.1 of Method 1 of 40 CFR part 60, Appendix A, the duct may be sampled at '3-point long line'; otherwise, conduct the stratification testing and select sampling points according to Section 8.1.2 of Method 7E of 40 CFR part 60, Appendix A.
		ii. Determine the O ₂ concentration of the stationary internal combustion engine exhaust at the sampling port location;	(2) Method 3, 3A, or 3B ^b of 40 CFR part 60, appendix A-2 or ASTM Method D6522-00 (Reapproved 2005) ^{ad}	(b) Measurements to determine O ₂ concentration must be made at the same time as the measurements for VOC concentration.
		iii. If necessary, determine the exhaust flowrate	(3) Method 2 or 2C of 40 CFR 60, appendix A-1 or Method 19 of	(c) Measurements to determine the exhaust flowrate must be made (1) at the same time as the measurement for

		of the stationary internal combustion engine exhaust;	40 CFR part 60, appendix A-7	VOC concentration or, alternatively (2) according to the option in Section 11.1.2 of Method 1A of 40 CFR part 60, Appendix A-1, if applicable.
		iv. If necessary, measure moisture content of the stationary internal combustion engine exhaust at the sampling port location; and	(4) Method 4 of 40 CFR part 60, appendix A-3, Method 320 of 40 CFR part 63, appendix A ^e , or ASTM Method D6348-03 ^{de}	(d) Measurements to determine moisture must be made at the same time as the measurement for VOC concentration.
		v. Measure VOC at the exhaust of the stationary internal combustion engine; if using a control device, the sampling site must be located at the outlet of the control device	(5) Methods 25A and 18 of 40 CFR part 60, appendices A-6 and A-7, Method 25A with the use of a hydrocarbon cutter as described in 40 CFR 1065.265, Method 18 of 40 CFR part 60, appendix A-6 ^{ce} , Method 320 of 40 CFR part 63, appendix A ^e , or ASTM Method D6348-03 ^{de}	(e) Results of this test consist of the average of the three 1-hour or longer runs.

^a Also, you may petition the Administrator for approval to use alternative methods for portable analyzer.

^b You may use ASME PTC 19.10-1981, Flue and Exhaust Gas Analyses, for measuring the O₂ content of the exhaust gas as an alternative to EPA Method 3B. AMSE PTC 19.10-1981 incorporated by reference, see 40 CFR 60.17

^c You may use EPA Method 18 of 40 CFR part 60, appendix A-6, provided that you conduct an adequate pre-survey test prior to the emissions test, such as the one described in OTM 11 on EPA's Web site (<http://www.epa.gov/ttn/emc/prelim/otm11.pdf>).

^d Incorporated by reference; see 40 CFR 60.17.

^e You must meet the requirements in §60.4245(d).

Subpart KKKK— Standards of Performance for Stationary Combustion Turbines

19. Amend § 60.4415 by revising paragraph (a) introductory text, redesignating paragraphs (a)(1) through (3) as paragraphs (a)(2) through (4), adding new paragraph (a)(1), and revising the newly redesignated paragraph (a)(2) to read as follows:

§ 60.4415 How do I conduct the initial and subsequent performance tests for sulfur?

(a) You must conduct an initial performance test, as required in §60.8. Subsequent SO₂ performance tests shall be conducted on an annual basis (no more than 14 calendar months following the previous performance test). There are four methodologies that you may use to conduct the performance tests.

(1) The use of a current, valid purchase contract, tariff sheet, or transportation contract for the fuel specifying the maximum total sulfur content of all fuels combusted in the affected facility. Alternately, the fuel sampling data specified in section 2.3.1.4 or 2.3.2.4 of appendix D to part 75 of this chapter may be used.

(2) Periodically determine the sulfur content of the fuel combusted in the turbine, a representative fuel sample may be collected either by an automatic sampling system or manually. For automatic sampling, follow ASTM D5287 (incorporated by reference, see §60.17) for gaseous fuels or ASTM D4177 (incorporated by reference, see §60.17) for liquid fuels. For manual sampling of gaseous fuels, follow API Manual of Petroleum Measurement Standards, Chapter 14, Section 1, GPA 2166, or ISO 10715 (all incorporated by reference, see §60.17). For manual sampling of liquid fuels, follow GPA 2174 or the procedures for manual pipeline sampling in section 14 of ASTM D4057 (both incorporated by reference, see §60.17). The fuel analyses of this section may be performed either by you, a service contractor retained by you, the fuel vendor, or any other qualified agency. Analyze the samples for the total sulfur content of the fuel using:

(i) For liquid fuels, ASTM D129, or alternatively D1266, D1552, D2622, D4294, D5453, D5623, or D7039 (all incorporated by reference, see §60.17); or

(ii) For gaseous fuels, ASTM D1072, or alternatively D3246, D4084, D4468, D4810, D6228, D6667, or GPA 2140, 2261, or 2377 (all incorporated by reference, see §60.17).

* * * * *

Subpart QQQQ—Standards of Performance for New Residential Hydronic Heaters and Forced-Air Furnaces

20. Amend § 60.5476 by revising paragraph (i) to read as follows:

§ 60.5476 What test methods and procedures must I use to determine compliance with the standards and requirements for certification?

* * * * *

(i) The approved test laboratory must allow the manufacturer, the manufacturer's approved third-party certifier, the EPA and delegated state regulatory agencies to observe certification testing.

However, manufacturers must not involve themselves in the conduct of the test after the pretest burn has begun. Communications between the manufacturer and laboratory or third-party certifier personnel regarding operation of the central heater must be limited to written communications transmitted prior to the first pretest burn of the certification test series. During certification tests, the manufacturer may communicate with the third-party certifier, and only in writing to notify them that the manufacturer has observed a deviation from proper test procedures by the laboratory. All communications must be included in the test documentation required to be submitted pursuant to §60.5475(b)(5) and must be consistent with instructions provided in the owner's manual required under §60.5478(f).

21. Amend Appendix A-3 to part 60 by:

a. In Method 4, revising sections "2.1", "6.1.5", "8.1.2.1", "8.1.3", "8.1.3.2.1", "8.1.3.2.2", "8.1.4.2", "9.1", "11.1", "11.2", "12.1.1", "12.1.2", "12.1.3", "12.2.1", and "12.2.2" and "Figure 4-4" and "Figure 4-5"; and

b. In Method 5, revising sections "6.1.1.8", "6.2.4", "6.2.5", "8.1.2", "8.7.6.4", "12.1", "12.3", "12.4", "12.11.1", "12.11.2", "16.1.1.4", and "16.2.3.3" and "Figure 5-6".

The revisions read as follows:

Appendix A-3 to Part 60—Test Methods 4 through 5I

* * * * *

Method 4-Determination of Moisture Content in Stack Gases

* * * * *

2.1 A gas sample is extracted at a constant rate from the source; moisture is removed from the sample stream and determined gravimetrically.

* * * * *

6.1.5 Barometer and Balance. Same as Method 5, sections 6.1.2 and 6.2.5, respectively.

* * * * *

8.1.2.1 Transfer water into the first two impingers, leave the third impinger empty and add silica gel to the fourth impinger. Weigh the impingers before sampling and record the weight to the nearest 0.5g at a minimum.

* * * * *

8.1.3 Leak-Check Procedures.

8.1.3.1 Leak Check of Metering System Shown in Figure 4-1. That portion of the sampling train from the pump to the orifice meter should be leak-checked prior to initial use and after each shipment.

Leakage after the pump will result in less volume being recorded than is actually sampled. The following procedure is suggested (see Figure 5-2 of Method 5): Close the main valve on the meter box. Insert a one-hole rubber stopper with rubber tubing attached into the orifice exhaust pipe. Disconnect and vent the low side of the orifice manometer. Close off the low side orifice tap. Pressurize the system to 13 to 18 cm (5 to 7 in.) water column by blowing into the rubber tubing. Pinch off the tubing and observe the manometer for one minute. A loss of pressure on the manometer indicates a leak in the meter box; leaks, if present, must be corrected.

8.1.3.2 Pretest Leak Check. A pretest leak check of the sampling train is recommended, but not required. If the pretest leak check is conducted, the following procedure should be used.

8.1.3.2.1 After the sampling train has been assembled, turn on and set the filter and probe heating systems to the desired operating temperatures. Allow time for the temperatures to stabilize.

8.1.3.2.2 Leak-check the train by first plugging the inlet to the filter holder and pulling a 380 mm (15 in.) Hg vacuum. Then connect the probe to the train, and leak-check at approximately 25 mm (1 in.) Hg vacuum; alternatively, the probe may be leak-checked with the rest of the sampling train, in one step, at 380 mm (15 in.) Hg vacuum. Leakage rates in excess of 4 percent of the average sampling rate or $0.00057 \text{ m}^3/\text{min}$ (0.020 cfm), whichever is less, are unacceptable.

8.1.3.2.3 Start the pump with the bypass valve fully open and the coarse adjust valve completely closed. Partially open the coarse adjust valve, and slowly close the bypass valve until the desired vacuum is reached. Do not reverse the direction of the bypass valve, as this will cause water to back up into the filter holder. If the desired vacuum is exceeded, either leak-check at this higher vacuum, or end the leak check and start over.

8.1.3.2.4 When the leak check is completed, first slowly remove the plug from the inlet to the probe, filter holder, and immediately turn off the vacuum pump. This prevents the water in the impingers from being forced backward into the filter holder and the silica gel from being entrained backward into the third impinger.

8.1.3.3 Leak Checks During Sample Run. If, during the sampling run, a component (*e.g.*, filter assembly or impinger) change becomes necessary, a leak check shall be conducted immediately before the change is made. The leak check shall be done according to the procedure outlined in section 8.1.3.2 above, except that it shall be done at a vacuum equal to or greater than the maximum value recorded up to that point in the test. If the leakage rate is found to be no greater than 0.00057 m³/min (0.020 cfm) or 4 percent of the average sampling rate (whichever is less), the results are acceptable, and no correction will need to be applied to the total volume of dry gas metered; if, however, a higher leakage rate is obtained, either record the leakage rate and plan to correct the sample volume as shown in section 12.3 of Method 5, or void the sample run.

NOTE: Immediately after component changes, leak checks are optional. If such leak checks are done, the procedure outlined in section 8.1.3.2 above should be used.

8.1.3.4 Post-Test Leak Check. A leak check of the sampling train is mandatory at the conclusion of each sampling run. The leak check shall be performed in accordance with the procedures outlined in section 8.1.3.2, except that it shall be conducted at a vacuum equal to or greater than the maximum value reached during the sampling run. If the leakage rate is found to be no greater than 0.00057 m³ min (0.020 cfm) or 4 percent of the average sampling rate (whichever is less), the results are acceptable, and no correction need be applied to the total volume of dry gas metered. If, however, a higher leakage rate is obtained, either record the leakage rate and correct the sample volume as shown in section 12.3 of Method 5 or void the sampling run.

* * * * *

8.1.4.2 At the end of the sample run, close the coarse adjust valve, remove the probe and nozzle from the stack, turn off the pump, record the final DGM meter reading, and conduct a post-test leak check, as outlined in section 8.1.3.4.

* * * * *

9.1 Miscellaneous Quality Control Measures.

Section	Quality control measure	Effect
Section 8.1.3.2.2	Leak rate of the sampling system cannot exceed four percent of the average sampling rate or 0.00057 m ³ /min (0.020 cfm)	Ensures the accuracy of the volume of gas sampled. (Reference Method).
Section 8.2.1	Leak rate of the sampling system cannot exceed two percent of the average sampling rate	Ensures the accuracy of the volume of gas sampled. (Approximation Method).

* * * * *

11.1 Reference Method. Weigh the impingers after sampling and record the difference in weight to the nearest 0.5 g at a minimum. Determine the increase in weight of the silica gel (or silica gel plus impinger) to the nearest 0.5 g at a minimum. Record this information (see example data sheet, Figure 4-5), and calculate the moisture content, as described in section 12.0.

11.2 Approximation Method. Weigh the contents of the two impingers, and measure the weight to the nearest 0.5 g.

* * * * *

12.1.1 Nomenclature.

B_{ws} = Proportion of water vapor, by volume, in the gas stream.

M_w = Molecular weight of water, 18.015 g/g-mole (18.015 lb/lb-mole).

P_m = Absolute pressure (for this method, same as barometric pressure) at the dry gas meter, mm Hg (in. Hg).

P_{std} = Standard absolute pressure, 760 mm Hg (29.92 in. Hg).

R = Ideal gas constant, 0.06236 (mm Hg)(m³)/(g-mole)(°K) for metric units and 21.85 (in. Hg)(ft³)/(lb-mole)(°R) for English units.

T_m = Absolute temperature at meter, °K (°R).

T_{std} = Standard absolute temperature, 293.15 °K (527.67 °R).

V_f = Final weight of condenser water plus impinger, g.

V_i = Initial weight, if any, of condenser water plus impinger, g.

V_m = Dry gas volume measured by dry gas meter, dcm (dcf).

$V_{m(std)}$ = Dry gas volume measured by the dry gas meter, corrected to standard conditions, dscm (dscf).

$V_{wc(std)}$ = Volume of water vapor condensed, corrected to standard conditions, scm (scf).

$V_{wsg(std)}$ = Volume of water vapor collected in silica gel, corrected to standard conditions, scm (scf).

W_f = Final weight of silica gel or silica gel plus impinger, g.

W_i = Initial weight of silica gel or silica gel plus impinger, g.

Y = Dry gas meter calibration factor.

ΔV_m = Incremental dry gas volume measured by dry gas meter at each traverse point, dcm (dcf).

12.1.2 Volume of Water Vapor Condensed.

$$V_{wc(std)} = \frac{(V_f - V_i)RT_{std}}{P_{std}M_w} \quad Eq\ 4 - 1$$
$$= K_1(V_f - V_i)$$

Where:

$$K_1 = 0.001335 \text{ m}^3/\text{g} \text{ for metric units,}$$
$$= 0.04716 \text{ ft}^3/\text{g} \text{ for English units.}$$

12.1.3 * * *

$$K_3 = 0.001335 \text{ m}^3 / \text{g} \text{ for metric units,}$$
$$= 0.04716 \text{ ft}^3 / \text{g} \text{ for English units.}$$

* * * * *

12.2.1 Nomenclature.

B_{wm} = Approximate proportion by volume of water vapor in the gas stream leaving the second impinger, 0.025.

B_{ws} = Water vapor in the gas stream, proportion by volume.

M_w = Molecular weight of water, 18.015 g/g-mole (18.015 lb/lb-mole).

P_m = Absolute pressure (for this method, same as barometric pressure) at the dry gas meter, mm Hg (in. Hg).

P_{std} = Standard absolute pressure, 760 mm Hg (29.92 in. Hg).

R = Ideal gas constant, 0.06236 [(mm Hg)(m³)]/[(g-mole)(K)] for metric units and 21.85 [(in. Hg)(ft³)]/[(lb-mole)(°R)] for English units.

T_m = Absolute temperature at meter, °K (°R).

T_{std} = Standard absolute temperature, 293.15 °K (527.67 °R).

V_f = Final weight of condenser water plus impinger, g.

V_i = Initial weight, if any, of condenser water plus impinger, g.

V_m = Dry gas volume measured by dry gas meter, dcm (dcf).

$V_{m(std)}$ = Dry gas volume measured by dry gas meter, corrected to standard conditions, dscm (dscf).

$V_{wc(std)}$ = Volume of water vapor condensed, corrected to standard conditions, scm (scf).

Y = Dry gas meter calibration factor.

12.2.2 Volume of Water Vapor Collected.

$$V_{wc(std)} = \frac{(V_f - V_i)RT_{std}}{P_{std}M_w} \quad Eq\ 4 - 5$$

$$= K_5(V_f - V_i)$$

K_5 = 0.001335 m³/g for metric units,

= 0.04716 ft³/g for English units.

* * * * *

Clock Time	Gas Volume through meter (Vm), (m ³ or ft ³)	Rate meter setting (m ³ /min or ft ³ /min)	Meter temperature (°C or °F)
------------	--	---	---------------------------------

Figure 4-4. Example Moisture Determination Field Data Sheet – Approximation Method

	Impinger weight (g)	Silica gel weight (g)
Final		
Initial		
Difference		

Figure 4-5. Analytical Data – Reference Method

Method 5-Determination of Particulate Matter Emissions From Stationary Sources

* * * * *

6.1.1.8 Condenser. The following system shall be used to determine the stack gas moisture content: Four impingers connected in series with leak-free ground glass fittings or any similar leak-free noncontaminating fittings. The first, third, and fourth impingers shall be of the Greenburg-Smith design, modified by replacing the tip with a 1.3 cm (1/2 in.) ID glass tube extending to about 1.3 cm (1/2 in.) from the bottom of the flask. The second impinger shall be of the Greenburg-Smith design with the standard tip. Modifications (e.g., using flexible connections between the impingers, using materials other than glass, or using flexible vacuum lines to connect the filter holder to the condenser) may be used, subject to the approval of the Administrator. The first and second impingers shall contain known quantities of water (Section 8.3.1), the third shall be empty, and the fourth shall contain a known weight of silica gel, or equivalent desiccant. A temperature sensor, capable of measuring temperature to within

1 °C (2 °F) shall be placed at the outlet of the fourth impinger for monitoring purposes. Alternatively, any system that cools the sample gas stream and allows measurement of the water condensed and moisture leaving the condenser, each to within 0.5 g may be used, subject to the approval of the Administrator. An acceptable technique involves the measurement of condensed water either gravimetrically and the determination of the moisture leaving the condenser by: (1) monitoring the temperature and pressure at the exit of the condenser and using Dalton's law of partial pressures; or (2) passing the sample gas stream through a tared silica gel (or equivalent desiccant) trap with exit gases kept below 20 °C (68 °F) and determining the weight gain. If means other than silica gel are used to determine the amount of moisture leaving the condenser, it is recommended that silica gel (or equivalent) still be used between the condenser system and pump to prevent moisture condensation in the pump and metering devices and to avoid the need to make corrections for moisture in the metered volume.

NOTE: If a determination of the PM collected in the impingers is desired in addition to moisture content, the impinger system described above shall be used, without modification. Individual States or control agencies requiring this information shall be contacted as to the sample recovery and analysis of the impinger contents.

* * * * *

6.2.4 Petri dishes. For filter samples; glass, polystyrene, or polyethylene, unless otherwise specified by the Administrator.

6.2.5 Balance. To measure condensed water to within 0.5 g at a minimum.

* * * * *

8.1.2 Check filters visually against light for irregularities, flaws, or pinhole leaks. Label filters of the proper diameter on the back side near the edge using numbering machine ink. As an alternative, label the shipping containers (glass, polystyrene or polyethylene petri dishes), and keep each filter in its identified container at all times except during sampling.

* * * * *

8.7.6.4 Impinger Water. Treat the impingers as follows: Make a notation of any color or film in the liquid catch. Measure the liquid that is in the first three impingers by weighing it to within 0.5 g at a minimum by using a balance. Record the weight of liquid present. This information is required to calculate the moisture content of the effluent gas. Discard the liquid after measuring and recording the weight, unless analysis of the impinger catch is required (see NOTE, section 6.1.1.8). If a different type of condenser is used, measure the amount of moisture condensed gravimetrically.

* * * * *

12.1 Nomenclature.

A_n = Cross-sectional area of nozzle, m^2 (ft^2).

B_{ws} = Water vapor in the gas stream, proportion by volume.

C_a = Acetone blank residue concentration, mg/mg.

c_s = Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, g/dscm (gr/dscf).

I = Percent of isokinetic sampling.

L_1 = Individual leakage rate observed during the leak-check conducted prior to the first component change, m^3/min (ft^3/min)

L_a = Maximum acceptable leakage rate for either a pretest leak-check or for a leak-check following a component change; equal to $0.00057 m^3/min$ ($0.020 cfm$) or 4 percent of the average sampling rate, whichever is less.

L_i = Individual leakage rate observed during the leak-check conducted prior to the “ i^{th} ” component change ($i = 1, 2, 3 \dots n$), m^3/min (cfm).

L_p = Leakage rate observed during the post-test leak-check, m^3/min (cfm).

m_a = Mass of residue of acetone after evaporation, mg.

m_n = Total amount of particulate matter collected, mg.

M_w = Molecular weight of water, 18.015 g/g-mole (18.015 lb/lb-mole).

P_{bar} = Barometric pressure at the sampling site, mm Hg (in. Hg).

P_s = Absolute stack gas pressure, mm Hg (in. Hg).

P_{std} = Standard absolute pressure, 760 mm Hg (29.92 in. Hg).

R = Ideal gas constant, 0.06236 ((mm Hg)(m³))/((K)(g-mole)) {21.85 ((in. Hg) (ft³))/((°R) (lb-mole))}.

T_m = Absolute average DGM temperature (see Figure 5-3), K (°R).

T_s = Absolute average stack gas temperature (see Figure 5-3), K (°R).

T_{std} = Standard absolute temperature, 293.15 K (527.67 °R).

V_a = Volume of acetone blank, ml.

V_{aw} = Volume of acetone used in wash, ml.

V_{lc} = Total volume of liquid collected in impingers and silica gel (see Figure 5-6), g.

V_m = Volume of gas sample as measured by dry gas meter, dcm (dcf).

$V_{m(std)}$ = Volume of gas sample measured by the dry gas meter, corrected to standard conditions, dscm (dscf).

$V_{w(std)}$ = Volume of water vapor in the gas sample, corrected to standard conditions, scm (scf).

V_s = Stack gas velocity, calculated by Method 2, Equation 2-7, using data obtained from Method 5, m/sec (ft/sec).

W_a = Weight of residue in acetone wash, mg.

Y = Dry gas meter calibration factor.

ΔH = Average pressure differential across the orifice meter (see Figure 5-4), mm H₂O (in. H₂O).

ρ_a = Density of acetone, mg/ml (see label on bottle).

θ = Total sampling time, min.

θ_1 = Sampling time interval, from the beginning of a run until the first component change, min.

θ_i = Sampling time interval, between two successive component changes, beginning with the interval between the first and second changes, min.

θ_p = Sampling time interval, from the final (nth) component change until the end of the sampling run, min.

13.6 = Specific gravity of mercury.

60 = Sec/min.

100 = Conversion to percent.

* * * * *

12.3 * * *

$K_1 = 0.38572 \text{ } ^\circ\text{K/mm Hg}$ for metric units, = $17.636 \text{ } ^\circ\text{R/in. Hg}$ for English units.

* * * * *

12.4 Volume of Water Vapor Condensed

$$V_{w(std)} = V_{lc} \frac{RT_{std}}{M_w P_{std}} \quad \text{Eq. 5-2}$$
$$= K_2 V_{lc}$$

Where: $K_2 = 0.001335 \text{ m}^3/\text{g}$ for metric units, = $0.04716 \text{ ft}^3/\text{g}$ for English units.

* * * * *

12.11.1 * * *

Where: $K_4 = 0.003456 \text{ ((mm Hg)(m}^3\text{))}/\text{((ml)(}^\circ\text{K))}$ for metric units,
= $0.002668 \text{ ((in. Hg)(ft}^3\text{))}/\text{((ml)(}^\circ\text{R))}$ for English units.

* * * * *

12.11.2 * * *

Where:

$K_5 = 4.3209$ for metric units, = 0.09450 for English units.

* * * * *

16.1.1.4 * * *

Where:

$K_1 = 0.38572 \text{ } ^\circ\text{K}/\text{mm Hg}$ for metric units, = $17.636 \text{ } ^\circ\text{R}/\text{in. Hg}$ for English units.

$T_{\text{adj}} = 273.15 \text{ } ^\circ\text{C}$ for metric units = 459.67°F for English units.

* * * * *

16.2.3.3 * * *

Where: $K_1 = 0.38572 \text{ } ^\circ\text{K}/\text{mm Hg}$ for metric units, = $17.636 \text{ } ^\circ\text{R}/\text{in. Hg}$ for English units.

* * * * *

18.0 * * *

Plant _____
 Date _____
 Run No. _____
 Filter No. _____

Amount liquid lost during transport, mg _____
 Acetone blank volume, ml _____
 Acetone blank concentration, mg/mg (Equation 5-4) _____
 Acetone wash blank, mg (Equation 5-5) _____

Container number	Weight of particulate collected, mg		
	Final weight	Tare weight	Weight gain
1.			
2.			
Total collected particulate			
Less acetone wash blank			
Weight of particulate matter			
	Weight of liquid collected, g		
	Impinger weight	Silica gel weight	
Final			
Initial			
Liquid collected			
Total weight collected			

Figure 5-6. Analytical Data Sheet

* * * * *

22. Amend Appendix A-4 to part 60 in Method 7C by revising section 7.2.11 and in Method 7E by revising section 8.5 introductory text to read as follows:

Appendix A-4 to Part 60—Test Methods 6 Through 10B

* * * * *

Method 7C-Determination of Nitrogen Oxide Emissions From Stationary Sources –Alkaline-Permanganate/Colorimetric Method

* * * * *

7.2.11 Sodium Nitrite (NaNO_2) Standard Solution, Nominal Concentration, 1000 $\mu\text{g NO}_2^-/\text{ml}$. Desiccate NaNO_2 overnight. Accurately weigh 1.4 to 1.6 g of NaNO_2 (assay of 97 percent NaNO_2 or greater), dissolve in water, and dilute to 1 liter. Calculate the exact NO_2 -concentration using Equation 7C-1 in section 12.2. This solution is stable for at least 6 months under laboratory conditions.

* * * * *

Method 7E-Determination of Nitrogen Oxide Emissions from Stationary Sources (Instrumental Analyzer Procedure)

* * * * *

8.5 Post-Run System Bias Check and Drift Assessment.

How do I confirm that each sample I collect is valid? After each run, repeat the system bias check or 2-point system calibration error check (for dilution systems) to validate the run. Do not make adjustments to the measurement system (other than to maintain the target sampling rate or dilution ratio) between the end of the run and the completion of the post-run system bias or system calibration error check. Note that for all post-run system bias or 2-point system calibration error checks, you may inject the low-level gas first and the upscale gas last, or vice-versa. If conducting a relative accuracy test or relative accuracy test audit, consisting of nine runs or more, you may risk sampling for up to three runs before performing

the post-run bias or system calibration error check provided you pass this test at the conclusion of the group of three runs. A failed post-run bias or system calibration error check in this case will invalidate all runs subsequent to the last passed check. When conducting a performance or compliance test, you must perform a post-run system bias or system calibration error check after each individual test run.

* * * * *

23. Amend Appendix A-5 to part 60, Method 12 by:

- a. Revising sections “7.1.2”, “8.7.1.6”, “8.7.3.1”, “8.7.3.3”, “8.7.3.6”, “12.1”, “12.3”, “16.1” through “16.5”;
- b. Adding sections 16.5.1 and 16.5.2; and
- c. Removing section 16.6.

The revisions and additions read as follows:

Appendix A-5 to Part 60-Test Methods 11 Through 15A

* * * * *

Method 12-Determination of Inorganic Lead Emissions From Stationary Sources

* * * * *

7.1.2 Silica Gel and Crushed Ice. Same as Method 5, sections 7.1.2 and 7.1.4, respectively.

* * * * *

8.7.1.6 Brush and rinse with 0.1 N HNO₃ the inside of the front half of the filter holder. Brush and rinse each surface three times or more, if needed, to remove visible sample matter. Make a final rinse of the brush and filter holder. After all 0.1 N HNO₃ washings and sample matter are collected in the sample container, tighten the lid on the sample container so that the fluid will not leak out when it is shipped to the laboratory. Mark the height of the fluid level to determine whether leakage occurs during transport. Label the container to identify its contents clearly.

* * * * *

8.7.3.1. Cap the impinger ball joints.

* * * * *

8.7.3.3 Treat the impingers as follows: Make a notation of any color or film in the liquid catch. Measure the liquid that is in the first three impingers by weighing it to within 0.5 g at a minimum by using a balance. Record the weight of liquid present. The liquid weight is needed, along with the silica gel data, to calculate the stack gas moisture content (see Method 5, Figure 5-6).

* * * * *

8.7.3.6. Rinse the insides of each piece of connecting glassware for the impingers twice with 0.1 N HNO₃; transfer this rinse into Container No. 4. Do not rinse or brush the glass-fritted filter support. Mark the height of the fluid level to determine whether leakage occurs during transport. Label the container to identify its contents clearly.

* * * * *

12.1 Nomenclature.

A_m = Absorbance of the sample solution.

A_n = Cross-sectional area of nozzle, m^2 (ft^2).

A_t = Absorbance of the spiked sample solution.

B_{ws} = Water in the gas stream, proportion by volume.

C_a = Lead concentration in standard solution, $\mu g/ml$.

C_m = Lead concentration in sample solution analyzed during check for matrix effects, $\mu g/ml$.

C_s = Lead concentration in stack gas, dry basis, converted to standard conditions, $mg/dscm$ ($gr/dscf$).

I = Percent of isokinetic sampling.

L_1 = Individual leakage rate observed during the leak-check conducted prior to the first component change, m^3/min (ft^3/min)

L_a = Maximum acceptable leakage rate for either a pretest leak-check or for a leak-check following a component change; equal to $0.00057 m^3/min$ ($0.020 cfm$) or 4 percent of the average sampling rate, whichever is less.

L_i = Individual leakage rate observed during the leak-check conducted prior to the "ith" component change ($i = 1, 2, 3 * * * n$), m^3/min (cfm).

L_p = Leakage rate observed during the post-test leak-check, m^3/min (cfm).

m_t = Total weight of lead collected in the sample, μg .

M_w = Molecular weight of water, $18.0 g/g\text{-mole}$ ($18.0 lb/lb\text{-mole}$).

P_{bar} = Barometric pressure at the sampling site, $mm Hg$ ($in. Hg$).

P_s = Absolute stack gas pressure, $mm Hg$ ($in. Hg$).

P_{std} = Standard absolute pressure, $760 mm Hg$ ($29.92 in. Hg$).

R = Ideal gas constant, $0.06236 [(mm Hg) (m^3)]/[(^\circ K) (g\text{-mole})]$ $\{21.85 [(in. Hg) (ft^3)]/[(^\circ R) (lb\text{-mole})]\}$.

T_m = Absolute average dry gas meter temperature (see Figure 5-3 of Method 5), $^\circ K$ ($^\circ R$).

T_{std} = Standard absolute temperature, $293 ^\circ K$ ($528 ^\circ R$).

v_s = Stack gas velocity, m/sec (ft/sec).

V_m = Volume of gas sample as measured by the dry gas meter, dry basis, m^3 (ft^3).

$V_{m(std)}$ = Volume of gas sample as measured by the dry gas meter, corrected to standard conditions, m^3 (ft^3).

$V_{w(std)}$ = Volume of water vapor collected in the sampling train, corrected to standard conditions, m^3 (ft^3).

Y = Dry gas meter calibration factor.

ΔH = Average pressure differential across the orifice meter (see Figure 5-3 of Method 5), mm H₂O (in. H₂O).

θ = Total sampling time, min.

θ_1 = Sampling time interval, from the beginning of a run until the first component change, min.

θ_i = Sampling time interval, between two successive component changes, beginning with the interval between the first and second changes, min.

θ_p = Sampling time interval, from the final (nth) component change until the end of the sampling run, min.

* * * * *

12.3 Dry Gas Volume, Volume of Water Vapor Condensed, and Moisture Content. Using data obtained in this test, calculate $V_{m(std)}$, $V_{w(std)}$, and B_{ws} according to the procedures outlined in Method 5, sections 12.3 through 12.5.

* * * * *

16.1 Simultaneous Determination of Particulate Matter and Lead Emissions. Method 12 may be used to simultaneously determine Pb and particulate matter provided:

(1) A glass fiber filter with a low Pb background is used and this filter is checked, desiccated and weighed per section 8.1 of Method 5,

(2) An acetone rinse, as specified by Method 5, sections 7.2 and 8.7.6.2, is used to remove particulate matter from the probe and inside of the filter holder prior to and kept separate from the 0.1 N HNO₃ rinse of the same components,

(3) The recovered filter, the acetone rinse, and an acetone blank (Method 5, section 7.2) are subjected to the gravimetric analysis of Method 5, sections 6.3 and 11.0 prior to the analysis for Pb as described below, and

(4) The entire train contents, including the 0.1 N HNO₃ impingers, filter, acetone and 0.1 N HNO₃ probe rinses are treated and analyzed for Pb as described in sections 8.0 and 11.0 of this method.

16.2 Filter Location. A filter may be used between the third and fourth impingers provided the filter is included in the analysis for Pb.

16.3 In-Stack Filter. An in-stack filter may be used provided: (1) A glass-lined probe and at least two impingers, each containing 100 ml of 0.1 N HNO₃ after the in-stack filter, are used and (2) the probe and impinger contents are recovered and analyzed for Pb. Recover sample from the nozzle with acetone if a particulate analysis is to be made as described in section 16.1 of this method.

16.4 Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES) Analysis. ICP-AES may be used as an alternative to atomic absorption analysis provided the following conditions are met:

16.4.1 Sample collection/recovery, sample loss check, and sample preparation procedures are as defined in sections 8.0, 11.1, and 11.2, respectively, of this method.

16.4.2 Analysis shall be conducted following Method 6010D of SW-846 (incorporated by reference, see §60.17). The limit of detection for the ICP-AES must be demonstrated according to section 15.0 of Method 301 in appendix A of part 63 of this chapter and must be no greater than one-third of the applicable emission limit. Perform a check for matrix effects according to section 11.5 of this method.

16.5 Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) Analysis. ICP-MS may be used as an alternative to atomic absorption analysis provided the following conditions are met:

16.5.1 Sample collection/recovery, sample loss check, and sample preparation procedures are as defined in sections 8.0, 11.1, and 11.2, respectively of this method.

16.5.2 Analysis shall be conducted following Method 6020B of SW-846 (incorporated by reference, see §60.17). The limit of detection for the ICP-MS must be demonstrated according to section 15.0 of Method 301 in appendix A to part 63 of this chapter and must be no greater than one-third of the applicable emission limit. Use the multipoint calibration curve option in section 10.4 of Method 6020B and perform a check for matrix effects according to section 11.5 of this method.

* * * * *

24. Amend Appendix A-6 to part 60 by:

a. In Method 16B by:

i. Revising sections 2.1, 6.1, 8.2;

ii. Removing section 8.3;

iii. Redesignating sections 8.4, 8.4.1, and 8.4.2 as 8.3, 8.3.1, and 8.3.2, respectively;

iv. Revising section 11.1; and

v. Adding section 11.2; and

b. In Method 16C, revising section 13.1.

The revisions and addition read as follows:

Appendix A-6 to Part 60—Test Methods 16 Through 18

* * * * *

Method 16B—Determination of Total Reduced Sulfur Emissions From Stationary Sources

* * * * *

2.1 A gas sample is extracted from the stack. The SO₂ is removed selectively from the sample using a citrate buffer solution. The TRS compounds are then thermally oxidized to SO₂ and analyzed as SO₂ by gas chromatography (GC) using flame photometric detection (FPD).

* * * * *

6.1 Sample Collection. The sampling train is shown in Figure 16B-1. Modifications to the apparatus are accepted provided the system performance check in section 8.3.1 is met.

* * * * *

8.2 Sample Collection. Before any source sampling is performed, conduct a system performance check as detailed in section 8.3.1 to validate the sampling train components and procedures. Although this test is optional, it would significantly reduce the possibility of rejecting tests as a result of failing the post-test performance check. At the completion of the pretest system performance check, insert the sampling probe into the test port making certain that no dilution air enters the stack through the port. Condition the entire system with sample for a minimum of 15 minutes before beginning analysis. If the sample is diluted, determine the dilution factor as in section 10.4 of Method 15.

* * * * *

11.1 Analysis. Inject aliquots of the sample into the GC/FPD analyzer for analysis. Determine the concentration of SO₂ directly from the calibration curves or from the equation for the least-squares line.

11.2 Perform analysis of a minimum of three aliquots or one every 15 minutes, whichever is greater, spaced evenly over the test period.

* * * * *

Method 16C-Determination of Total Reduced Sulfur Emissions From Stationary Sources

* * * * *

13.1 Analyzer Calibration Error. At each calibration gas level (low, mid, and high), the calibration error must either not exceed 5.0 percent of the calibration span or $|C_{Dir}-C_v|$ must be ≤ 0.5 ppmv.

* * * * *

25. Amend Appendix A-7 to part 6 by:

a. In Method 24, revising section 6.2.

b. In Method 25C, revising sections 8.4.2, 9.1, 12.5, 12.5.1, and 12.5.2.

The revisions read as follows:

Appendix A-7 to Part 60—Test Methods 19 Through 25E

* * * * *

Method 24-Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings

* * * * *

6.2 ASTM D 2369-81, 87, 90, 92, 93, 95, or 10. Standard Test Method for Volatile Content of Coatings.

* * * * *

Method 25C-Determination of Nonmethane Organic Compounds (NMOC) in Landfill Gases

* * * * *

8.4.2 Use Method 3C to determine the percent N₂ and O₂ in each cylinder. The presence of N₂ and O₂ indicate either infiltration of ambient air into the landfill gas sample or an inappropriate testing site has been chosen where anaerobic decomposition has not begun. The landfill gas sample is acceptable if the concentration of N₂ is less than 20 percent. Alternatively, the oxygen content of each cylinder must be less than 5 percent. Landfills with 3-year average annual rainfalls equal to or less than 20 inches annual rainfalls samples are acceptable when the N₂ to O₂ concentration ratio is greater than 3.71.

* * * * *

9.1 Miscellaneous Quality Control Measures.

Section	Quality control measure	Effect
8.4.2	If the 3-year average annual rainfall is greater than 20 inches, verify that landfill gas sample contains less than 20 percent N ₂ and 5 percent O ₂ . Landfills with 3-year average annual rainfalls equal to or less than 20 inches annual rainfalls samples are acceptable when the N ₂ to O ₂ concentration ratio is greater than 3.71.	Ensures that ambient air was not drawn into the landfill gas sample and gas was sampled from an appropriate location. If outside of range, invalidate sample and repeat sample collection.
10.1, 10.2	NMOC analyzer initial and daily performance checks	Ensures precision of analytical results.

* * * * *

12.5 You must correct the NMOC Concentration for the concentration of nitrogen or oxygen based on which gas or gases passes the requirements in section 9.1 or based on the 3-year average annual rainfall based on the closest NOAA land-based station.

12.5.1 NMOC Concentration with nitrogen correction. Use Equation 25C-4 to calculate the concentration of NMOC for each sample tank when the nitrogen concentration is less than 20 percent.

$$C_t = \frac{\frac{P_{tf}}{T_{tf}}}{\left(\frac{P_t}{T_t} - \frac{P_{ti}}{T_{ti}}\right)\left(1 - \frac{99}{78}C_{N2}\right) - B_w} \frac{1}{r} \sum_{j=1}^r C_{tm(j)} \quad \text{Eq.25C-4}$$

12.5.2 NMOC Concentration with oxygen correction. Use Equation 25C-5 to calculate the concentration of NMOC for each sample tank if the landfill gas oxygen is less than 5 percent and the landfill gas nitrogen concentration is greater than 20 percent, or 3-year average annual rainfall based annual rainfall of less than 20 inches.

$$C_t = \frac{\frac{P_{tf}}{T_{tf}}}{\left(\frac{P_t}{T_t} - \frac{P_{ti}}{T_{ti}}\right)\left(1 - \frac{99}{21}C_{Ox}\right) - B_w} \frac{1}{r} \sum_{j=1}^r C_{tm(j)} \quad \text{Eq.25C-5}$$

* * * * *

26. Amend Appendix A-8 to part 60 by:

- a. In Method 26, revising section 8.1.2; and
- b. In Method 26A, revising sections 6.1.3 and 8.1.5.

The revisions read as follows:

Appendix A-8 to Part 60—Test Methods 26 Through 30B

* * * * *

Method 26—Determination of Hydrogen Halide and Halogen Emissions From Stationary Sources
Non-Isokinetic Method

* * * * *

8.1.2 Adjust the probe temperature and the temperature of the filter and the stopcock (*i.e.*, the heated area in Figure 26-1) to a temperature sufficient to prevent water condensation. This temperature must be maintained between 120 and 134 °C (248 and 273 °F). The temperature should be monitored throughout a sampling run to ensure that the desired temperature is maintained. It is important to maintain a temperature around the probe and filter in this range since it is extremely difficult to purge acid gases off these components. (These components are not quantitatively recovered and, hence, any collection of acid gases on these components would result in potential under reporting of these emissions. The applicable subparts may specify alternative higher temperatures.)

* * * * *

Method 26A-Determination of Hydrogen Halide and Halogen Emissions From Stationary Sources- Isokinetic Method

* * * * *

6.1.3 Pitot Tube, Differential Pressure Gauge, Filter Heating System, Filter Temperature Sensor with a glass or Teflon encasement, Metering System, Barometer, Gas Density Determination Equipment. Same as Method 5, sections 6.1.1.3, 6.1.1.4, 6.1.1.6, 6.1.1.7, 6.1.1.9, 6.1.2, and 6.1.3.

* * * * *

8.1.5 Sampling Train Operation. Follow the general procedure given in Method 5, Section 8.5. It is important to maintain a temperature around the probe, filter (and cyclone, if used) between 120 and 134 °C (248 and 273 °F) since it is extremely difficult to purge acid gases off these components. (These components are not quantitatively recovered and hence any collection of acid gases on these components would result in potential under reporting these emissions. The applicable subparts may specify alternative higher temperatures.) For each run, record the data required on a data sheet such as the one shown in Method 5, Figure 5-3. If the condensate impinger becomes too full, it may be emptied, recharged with 50 ml of 0.1 N H₂SO₄, and replaced during the sample run. The condensate emptied must be saved and included in the measurement of the volume of moisture collected and included in the sample for analysis. The additional 50 ml of absorbing reagent must also be considered in calculating the moisture. Before the sampling train integrity is compromised by removing the impinger, conduct a leak-check as described in Method 5, section 8.4.2.

* * * * *

27. Amend Appendix B to part 60 by:

- a. In Performance Specification 4B, revising section 4.5;
- b. In Performance Specification 5, revising sections 5.0 and 8.1;
- c. In Performance Specification 6, revising sections 13.1 and 13.2;
- d. In Performance Specification 8, redesignating sections 8.3, 8.4, and 8.5 as 8.4, 8.5, and 8.6, respectively;
- e. Adding new section 8.3;
- f. In Performance Specification 9, revising sections 7.2, 8.3, 8.4, 10.1, 10.2, 13.1, and 13.2;

g. Adding section 13.4;

h. In Performance Specification 18, revising sections 2.3 and 11.9.1.

The revisions and additions read as follows:

Appendix B to Part 60—Performance Specifications

* * * * *

Performance Specification 4B-Specifications and Test Procedures for Carbon Monoxide and Oxygen Continuous Monitoring Systems in Stationary Sources

* * * * *

4.5 *Response Time*. The response time for the CO or O₂ monitor must not exceed 240 seconds.

* * * * *

Performance Specification 5-Specifications and Test Procedures for TRS Continuous Emission Monitoring Systems in Stationary Sources

* * * * *

5.0 Safety

This performance specification may involve hazardous materials, operations, and equipment. This performance specification may not address all of the safety problems associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and determine the applicable regulatory limitations prior to performing this performance specification. The CEMS user's manual should be consulted for specific precautions to be taken with regard to the analytical procedures.

* * * * *

8.1 Relative Accuracy Test Procedure. Sampling Strategy for reference method (RM) Tests, Number of RM Tests, and Correlation of RM and CEMS Data are the same as PS 2, sections 8.4.3, 8.4.4, and 8.4.5, respectively.

NOTE: For Method 16, a sample is made up of at least three separate injects equally spaced over time. For Method 16A, a sample is collected for at least 1 hour. For Method 16B, you must analyze a minimum of three aliquots spaced evenly over the test period.

* * * * *

Performance Specification 6-Specifications and Test Procedures For Continuous Emission Rate Monitoring Systems in Stationary Sources

* * * * *

13.1 Calibration Drift. Since the CERMS includes analyzers for several measurements, the CD shall be determined separately for each analyzer in terms of its specific measurement. The calibration for each analyzer associated with the measurement of flow rate shall not drift or deviate from each reference value of flow rate by more than 3 percent of the respective high-level reference value over the CD test period (e.g., seven-day) associated with the pollutant analyzer. The CD specification for each analyzer for which other PSs have been established (e.g., PS 2 for SO₂ and NO_x), shall be the same as in the applicable PS.

13.2 CERMS Relative Accuracy. Calculate the CERMS Relative Accuracy using Eq. 2-6 of section 12 of Performance Specification 2. The RA of the CERMS shall be no greater than 20 percent of the mean value of the RM's test data in terms of the units of the emission standard, or in cases where the average

emissions for the test are less than 50 percent of the applicable standard, substitute the emission standard value in the denominator of Eq. 2-6 in place of the RM.

* * * * *

**Performance Specification 8-Performance Specifications for Volatile Organic Compound
Continuous Emission Monitoring Systems in Stationary Sources**

* * * * *

8.3 Calibration Drift Test Procedure. Same as section 8.3 of PS 2.

8.4 Reference Method (RM). Use the method specified in the applicable regulation or permit, or any approved alternative, as the RM.

8.5 Sampling Strategy for RM Tests, Correlation of RM and CEMS Data, and Number of RM Tests. Follow PS 2, sections 8.4.3, 8.4.5, and 8.4.4, respectively.

8.6 Reporting. Same as section 8.5 of PS 2.

* * * * *

**Performance Specification 9-Specifications and Test Procedures For Gas Chromatographic
Continuous Emission Monitoring Systems in Stationary Sources**

* * * * *

7.2 Performance Audit Gas. Performance Audit Gas is an independent cylinder gas or cylinder gas mixture. A certified EPA audit gas shall be used, when possible. A gas mixture containing all the target compounds within the calibration range and certified by EPA's Traceability Protocol for Assay and Certification of Gaseous Calibration Standards may be used when EPA performance audit materials are

not available. If a certified EPA audit gas or a traceability protocol gas is not available, use a gas manufacturer standard accurate to 2 percent.

* * * * *

8.3 Seven (7)-Day Calibration Error (CE) Test Period. At the beginning of each 24-hour period, set the initial instrument set points by conducting a multi-point calibration for each compound. The multi-point calibration shall meet the requirements in sections 13.1, 13.2, and 13.3. Throughout the 24-hour period, sample and analyze the stack gas at the sampling intervals prescribed in the regulation or permit. At the end of the 24-hour period, inject the calibration gases at three concentrations for each compound in triplicate and determine the average instrument response. Determine the CE for each pollutant at each concentration using Equation 9-2. Each CE shall be ≤ 10 percent. Repeat this procedure six more times for a total of 7 consecutive days.

8.4 Performance Audit Test Periods. Conduct the performance audit once during the initial 7-day CE test and quarterly thereafter. Performance Audit Tests must be conducted through the entire sampling and analyzer system. Sample and analyze the EPA audit gas(es) (or the gas mixture) three times. Calculate the average instrument response. Results from the performance audit test must meet the requirements in sections 13.3 and 13.4.

* * * * *

10.1 Multi-Point Calibration. After initial startup of the GC, after routine maintenance or repair, or at least once per month, conduct a multi-point calibration of the GC for each target analyte. Calibration is performed at the instrument independent of the sample transport system. The multi-point calibration for each analyte shall meet the requirements in sections 13.1, 13.2, and 13.3.

* * * * *

10.2 Daily Calibration. Once every 24 hours, analyze the mid-level calibration standard for each analyte in triplicate. Calibration is performed at the instrument independent of the sample transport system.

Calculate the average instrument response for each analyte. The average instrument response shall not vary by more than 10 percent from the certified concentration value of the cylinder for each analyte. If the difference between the analyzer response and the cylinder concentration for any target compound is greater than 10 percent, immediately inspect the instrument making any necessary adjustments, and conduct an initial multi-point calibration as described in section 10.1.

* * * * *

13.1 Calibration Error (CE). The CEMS must allow the determination of CE at all three calibration levels. The average CEMS calibration response must not differ by more than 10 percent of calibration gas value at each level after each 24-hour period and after any triplicate calibration response check.

13.2 Calibration Precision and Linearity. For each triplicate injection at each concentration level for each target analyte, any one injection shall not deviate more than 5 percent from the average concentration measured at that level. When the CEMS response is evaluated over three concentration levels, the linear regression curve for each organic compound shall be determined using Equation 9-1 and must have an $r^2 \geq 0.995$.

* * * * *

13.4 Performance Audit Test Error. Determine the error for each average pollutant measurement using the Equation 9-2 in section 12.3. Each error shall be less than or equal to 10 percent of the cylinder gas certified value. Report the audit results including the average measured concentration, the error and the certified cylinder concentration of each pollutant as part of the reporting requirements in the appropriate regulation or permit.

* * * * *

Performance Specification 18-Performance Specifications and Test Procedures for Gaseous Hydrogen Chloride (HCl) Continuous Emission Monitoring Systems at Stationary Sources

* * * * *

2.3 The relative accuracy (RA) must be established against a reference method (RM) (e.g., Method 26A, Method 320, ASTM International (ASTM) D6348-12, including mandatory annexes, or Method 321 for Portland cement plants as specified by the applicable regulation or, if not specified, as appropriate for the source concentration and category). Method 26 may be approved as a RM by the Administrator on a case-by-case basis if not otherwise allowed or denied in an applicable regulation.

* * * * *

11.9.1 Unless otherwise specified in an applicable regulation, use Method 26A in 40 CFR part 60, appendix A-8, Method 320 in 40 CFR part 63, appendix A, or ASTM D6348-12 including all annexes, as applicable, as the RMs for HCl measurement. Obtain and analyze RM audit samples, if they are available, concurrently with RM test samples according to the same procedure specified for performance tests in the general provisions of the applicable part. If Method 26 is not specified in an applicable subpart of the regulations, you may request approval to use Method 26 in appendix A-8 to this part as the RM on a site-specific basis under §§ 63.7(f) or 60.8(b). Other RMs for moisture, O₂, etc., may be necessary. Conduct the RM tests in such a way that they will yield results representative of the emissions from the source and can be compared to the CEMS data.

* * * * *

28. Amend Appendix F to part 60, in Procedure 1, by revising section 5.2.3(2) to read as follows:

Appendix F to Part 60-Quality Assurance Procedures

**Procedure 1-Quality Assurance Requirements for Gas Continuous Emission Monitoring Systems
Used for Compliance Determination**

* * * * *

5.2.3 * * *

(2) For the CGA, ± 15 percent of the average audit value or ± 5 ppm, whichever is greater; for diluent monitors, ± 15 percent of the average audit value.

* * * * *

PART 61—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

29. The authority citation for part 61 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

30. Amend Appendix B to part 61 by:

a. Adding the entries Method 114-Test Methods for Measuring Radionuclide Emissions from Stationary Sources and Method 115-Monitoring for Radon-222 Emissions at the end of the index for appendix B to part 61.

b. In Method 107, revising section 12.3, equation 107-3.

The additions and revisions read as follows:

Appendix B to Part 61-Test Methods

* * * * *

Method 114-Test Methods for Measuring Radionuclide Emissions from Stationary Sources

Method 115-Monitoring for Radon-222 Emissions

* * * * *

Method 107-Determination of Vinyl Chloride Content of In-Process Wastewater Samples, and Vinyl Chloride Content of Polyvinyl Chloride Resin Slurry, Wet Cake, and Latex Samples

* * * * *

12.3 * * *

$$C_{rvc} = \frac{A_s P_a}{R_f T_1} \frac{M_v V_g}{Rm} + K_p (TS) T_2 + K_w (1 - TS) T_2 \quad Eq. 107 - 3$$

* * * * *

PART 63—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES

31. The authority citation for part 63 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

32. Amend § 63.2 by revising the definition of “Alternative test method” to read as follows:

§ 63.2 Definitions.

* * *

Alternative test method means any method of sampling and analyzing for an air pollutant that has been demonstrated to the Administrator's satisfaction, using Method 301 in appendix A of this part, to produce results adequate for the Administrator's determination that it may be used in place of a test method specified in this part.

* * * * *

Subpart LLL—National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry

33. Amend § 63.1349, by revising paragraphs (b)(7)(viii)(A) and (B), (b)(8)(vi), and (b)(8)(vii)(B) and (C) to read as follows:

§ 63.1349 Performance testing requirements.

* * * * *

(b) * * *

(7) * * *

(viii) * * *

(A) Determine the THC CEMS average value in ppmvw, and the average of your corresponding three total organic HAP compliance test runs, using Equation 12.

$$\bar{x} = \frac{1}{n} \sum_{i=1}^n X_i, \bar{y} = \frac{1}{n} \sum_{i=1}^n Y_i \quad (\text{Eq. 12})$$

Where:

\bar{x} = The average THC CEMS value in ppmvw, as propane.

X_i = The THC CEMS data points in ppmvw, as propane, for all three test runs.

\bar{y} = The average organic HAP value in ppmvd, corrected to 7 percent oxygen.

Y_i = The organic HAP concentrations in ppmvd, corrected to 7 percent oxygen, for all three test runs.

n = The number of data points.

(B) You must use your 3-run average THC CEMS value and your 3-run average organic HAP concentration from your Method 18 and/or Method 320 compliance tests to determine the operating limit. Use equation 13 to determine your operating limit in units of ppmvw THC, as propane.

$$T_l = \left(\frac{9}{\bar{y}}\right) * \bar{x} \quad (\text{Eq. 13})$$

Where:

T_l = The 30-day operating limit for your THC CEMS, ppmvw, as propane.

\bar{y} = The average organic HAP concentration from Eq. 12, ppmvd, corrected to 7 percent oxygen.

\bar{x} = The average THC CEMS concentration from Eq. 12, ppmvw, as propane.

9 = 75 percent of the organic HAP emissions limit (12 ppmvd, corrected to 7 percent oxygen)

* * * * *

(8) * * *

(vi) If your kiln has an inline kiln/raw mill, you must conduct separate performance tests while the raw mill is operating (“mill on”) and while the raw mill is not operating (“mill off”). Using the fraction of time that the raw mill is on and the fraction of time that the raw mill is off, calculate this limit as a weighted average of the SO₂ levels measured during raw mill on and raw mill off compliance testing with Equation 17.

$$R = (y * t) + x * (1 - t) \quad (\text{Eq. 17})$$

Where:

R = Operating limit as SO₂, ppmv.

y = Average SO₂ CEMS value during mill on operations, ppmv.

t = Percentage of operating time with mill on, expressed as a decimal.

x = Average SO₂ CEMS value during mill off operations, ppmv.

1-t = Percentage of operating time with mill off, expressed as a decimal.

* * * * *

(vii) * * *

(B) Determine your SO₂ CEMS instrument average ppmv, and the average of your corresponding three HCl compliance test runs, using Equation 18.

$$\bar{x} = \frac{1}{n} \sum_{i=1}^n X_i, \bar{y} = \frac{1}{n} \sum_{i=1}^n Y_i \quad (\text{Eq. 18})$$

Where:

\bar{x} = The average SO₂ CEMS value in ppmv.

X_i = The SO₂ CEMS data points in ppmv for the three runs constituting the performance test.

\bar{y} = The average HCl value in ppmvd, corrected to 7 percent oxygen.

Y_i = The HCl emission concentration expressed as ppmvd, corrected to 7 percent oxygen for the three runs constituting the performance test.

n = The number of data points.

(C) With your instrument zero expressed in ppmv, your SO₂ CEMS three run average expressed in ppmv, and your 3-run HCl compliance test average in ppmvd, corrected to 7 percent O₂, determine a relationship of ppmvd HCl corrected to 7 percent O₂ per ppmv SO₂ with Equation 19.

$$R = \frac{\bar{y}}{(\bar{x} - z)} \quad (\text{Eq. 19})$$

Where:

R = The relative HCl ppmvd, corrected to 7 percent oxygen, per ppmv SO₂ for your SO₂ CEMS.

\bar{y} = The average HCl concentration from Eq. 18 in ppmvd, corrected to 7 percent oxygen.

\bar{x} = The average SO₂ CEMS value from Eq. 18 in ppmv.

z = The instrument zero output ppmv value.

* * * * *

34. Amend Appendix A to part 63 by:

a. In Method 301, revising section 11.1.3;

b. In Method 308, revising section 12.4, equation 308-3 and section 12.5, equation 308-5;

c. In Method 311, revising sections 1.1 and 17;

d. In Method 315, revising Figure 315-1;

e. In Method 316, revising section 1.0; and

f. In Method 323, revising the method heading and section 2.0.

The revisions read as follows:

Appendix A to Part 63-Test Methods Pollutant Measurement Methods From Various Waste Media

* * * * *

Method 301-Field Validation of Pollutant Measurement Methods From Various Waste Media

* * * * *

11.1.3 *T Test*. Calculate the t-statistic using Equation 301-13.

$$t = \frac{|d_m|}{\left(\frac{SD_d}{\sqrt{n}}\right)} \quad (\text{Eq. 301-13})$$

* * *

* * * * *

Method 308-Procedure for Determination of Methanol Emission from Stationary Sources

* * * * *

12.4 * * *

$$E = \frac{M_{tot} Q_{std}}{V_{m(std)}} \quad \text{Equation 308-3}$$

12.5 * * *

$$R = \frac{m_v v_s}{s} \quad \text{Equation 308-5}$$

* * * * *

Method 311-Analysis of Hazardous Air Pollutant Compounds in Paints and Coatings By Direct Injection Into A Gas Chromatograph

* * * * *

1.1 Applicability. This method is applicable for determination of most compounds designated by the U.S. Environmental Protection Agency as volatile hazardous air pollutants (HAP's) (See Reference 1) that are contained in paints and coatings. Styrene, ethyl acrylate, and methyl methacrylate can be measured by ASTM D 4827-03. Formaldehyde can be measured by ASTM D 5910-05 or ASTM D 1979-91. Toluene diisocyanate can be measured in urethane prepolymers by ASTM D 3432-89. Method 311 applies only to those volatile HAP's which are added to the coating when it is manufactured, not to those that may form as the coating cures (reaction products or cure volatiles). A separate or modified test procedure must be used to measure these reaction products or cure volatiles in order to determine the total volatile HAP emissions from a coating. Cure volatiles are a significant component of the total HAP content of some coatings. The term "coating" used in this method shall be understood to mean paints and coatings.

* * * * *

17. * * *

4. Standard Test Method for Determination of Dichloromethane and 1,1,1-Trichloroethane in Paints and Coatings by Direct Injection into a Gas Chromatograph. ASTM Designation D4457-02.

5. Standard Test Method for Determining the Unreacted Monomer Content of Latexes Using Capillary Column Gas Chromatography. ASTM Designation D4827-03.

6. Standard Test Method for Determining Unreacted Monomer Content of Latexes Using Gas-Liquid Chromatography, ASTM Designation D4747-02.

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Method 315-Determination of Particulate and Methylene Chloride Extractable Matter (MCEM) From Selected Sources at Primary Aluminum Production Facilities

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FIGURE 315-1. PARTICULATE AND MCEM ANALYSES

Particulate Analysis					
Plant					
Date					
Run No.					
Filter No.					
Amount liquid lost during transport					
Acetone blank volume (ml)					
Acetone blank concentration (Eq. 315-4) (mg/mg)					
Acetone wash blank (Eq. 315-5) (mg)					
			Final weight (mg)	Tare weight (mg)	Weight gain (mg)
Container No. 1					
Container No. 2					
Total					
Less Acetone blank					
Weight of particulate matter					
			Final volume (mg)	Initial volume (mg)	Liquid collected (mg)
Moisture Analysis					
Impingers			Note 1	Note 1	
Silica gel					
Total					
NOTE 1: Convert volume of water to weight by multiplying by the density of water (1 g/ml).					
Container No.	Final weight (mg)	Tare of aluminum dish (mg)	Weight gain	Acetone wash volume (ml)	Methylene chloride wash volume (ml)
MCEM Analysis					
1					
2 + 2M					
3W					

3S					
Total			Σm_{total}	$0V_{\text{aw}}$	ΣV_{tw}
Less acetone wash blank (mg) (not to exceed 1 mg/l of acetone used)					$w_a = c_a p_a \Sigma V_{\text{aw}}$
Less methylene chloride wash blank (mg) (not to exceed 1.5 mg/l of methylene chloride used)					$w_t = c_t p_t \Sigma V_{\text{tw}}$
Less filter blank (mg) (not to exceed 0.5 mg/filter)					F_b
MCEM weight (mg)					$m_{\text{MCEOM}} = \Sigma m_{\text{total}} - w_a - w_t - f_b$

Method 316-Sampling and Analysis for Formaldehyde Emissions From Stationary Sources in the Mineral Wool and Wool Fiberglass Industries

1.0 Scope and Application

This method is applicable to the determination of formaldehyde, CAS Registry number 50-00-0, from stationary sources in the mineral wool and wool fiber glass industries. High purity water is used to collect the formaldehyde. The formaldehyde concentrations in the stack samples are determined using the modified pararosaniline method. Formaldehyde can be detected as low as 8.8×10^{-10} lbs/cu ft (11.3 ppbv) or as high as 1.8×10^{-3} lbs/cu ft (23,000,000 ppbv), at standard conditions over a 1-hour sampling period, sampling approximately 30 cu ft.

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Method 323-Measurement of Formaldehyde Emissions From Natural Gas-Fired Stationary Sources—Acetyl Acetone Derivatization Method

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2.0 Summary of Method. An emission sample from the combustion exhaust is drawn through a midjet impinger train containing chilled reagent water to absorb formaldehyde. The formaldehyde concentration in the impinger is determined by reaction with acetyl acetone to form a colored derivative which is measured colorimetrically.

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