



Project Summary

Quality Assurance Procedures: Method 28 Certification and Auditing of Wood Heaters

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The full report is a comprehensive document intended to be used as an aid for wood heater manufacturers and testing laboratories in performing particulate matter sampling of wood heaters according to EPA protocol, Method 28. These procedures may be used in research and development, and as an aid in auditing and certification testing. A detailed, step-by-step quality assurance guide is provided to aid in the procurement and assembly of testing apparatus, to clearly describe the procedures, and to facilitate data collection and reporting. Suggested data sheets are supplied that can be used as an aid for both recordkeeping and certification applications. Throughout the document, activity matrices are provided to serve as a summary reference. Checklists are also supplied that can be used by testing personnel. Finally, for the purposes of ensuring data quality, procedures are outlined for apparatus operation, maintenance, and auditing. These procedures combined with the detailed description of the sampling and analysis protocol will help ensure the accuracy and reliability of emission testing results.

This Project Summary was developed by EPA's Atmospheric Research and Exposure Assessment Laboratory, Research Triangle Park, NC, to announce key findings of the research project that is fully documented in a separate report of the same title (see

Project Report ordering information at back).

Introduction

Quality Assurance Procedures: Method 28, Certification and Auditing of Wood Heaters has been prepared as an aid for wood heater manufacturers and testing laboratories in performing the wood heater operation procedures specified in Appendix A, 40 CFR 60 (Method 28), and in ensuring data quality and reliability. Method 28 must be used for operation of the wood heater when using Method 5G for determining wood heater emissions. Therefore the user may also refer to *Quality Assurance Procedures: Method 5G, Determination of Particulate Emissions from Wood Heaters from a Dilution Tunnel Sampling Location*.

Method Highlights

EPA Method 28 contains all the requirements and describes the apparatus and procedures for the emission certification testing of wood heaters. The apparatus and procedures are used with various sampling methods (e.g., Method 28A, Method 5H). Method 28 is unique in that its purpose is to ensure consistency in wood heater emissions rather than to sample the emissions. For this reason, to get accurate and repeatable emission sampling data, it is extremely important to follow procedures described in Method 28 closely. Following test procedure closely is ultimately to the advantage of both the wood heater manufacturer and the test laboratory.

Quality Assurance Procedures Highlights

These procedures, *Quality Assurance Procedures: Method 28, Certification and Auditing of Wood Heaters*, are to be used as an aid in assembling the testing apparatus, to list and describe the required procedures, and to facilitate the data reporting. Activity matrices are provided at the end of the appropriate sections. For data reporting, Section 11.0 consists of blank data sheets which can be reproduced and used in data collection and reporting. Examples of the use of these sheets are given in the manual.

Section 1.0 presents the specifications, criteria, and design features for the equipment and materials required to set up and operate a wood heater according to Method 28. This section is intended to inform the user of the apparatus selection options and the rationale for selecting a particular piece of equipment. The activity matrix given at the end of Section 1.0 can be used as a convenient checklist for equipment procurement and initial acceptance check procedures.

Section 2.0 provides an item-by-item, step-by-step guide to the required calibration procedures and calibration frequencies. Some of the apparatus (e.g., platform scale and moisture content meter) require calibration before each certification test while other pieces of apparatus require calibration semi-annually.

An activity matrix is provided at the end of Section 2.0 as a summary of the calibration procedures.

Section 3.0 describes procedures that are conducted before emission sampling

begins. These procedures include firebox volume measurements, wood heater installation, apparatus check and calibration, catalytic combustor and wood heater aging, validation of secondary air adjustments, test fuel measurements and crib construction, measurement of the facility conditions, and presampling burn activities. Illustrations, examples, and an activity checklist are provided to assist testing personnel in performing and documenting pretest procedures. An activity matrix provides a summary of the purpose, specifications, and time and frequency of each pretest activity.

Section 4.0 lists and describes the activities performed during the test run. These activities include beginning the test run, measurement of test run data at 10-minute intervals, adjustment of fuel and air supply settings, test run completion, and recording of data. An activity matrix is provided listing in chronological order each activity performed during the test run.

Illustrations and examples are provided to assist testing personnel in performing and documenting test run activities.

Section 5.0 describes the activities required at the end of the certification test run. These include: the measurement of test facility condition parameters, recording the wood heater surface temperatures, and sampling train and equipment leak checks. Recommended procedures also include performing a calibration check on the platform scale and measurement of the fluid level in the liquid seal.

Section 6.0 describes calculations necessary for performing and reporting Method 28 procedures. Calculations for

determining weighted particulate emission rates, dry burn rates, and validating secondary air adjustment are provided. Examples are included.

Section 7.0 summarizes recommendations on maintenance of equipment. Section 8.0 describes recommended audit procedures, including both performance audits and system audits. A table is provided that summarizes these procedures. Section 9.0 contains a copy of Method 28 as proposed in the *Federal Register* (40 CFR 60.530). Section 10.0 provides the reader with a list of the references used in the preparation of this document. Section 11.0 provides sheets that can be used for calculations, recordkeeping, and data reporting. These sheets may be removed and duplicated.

Conclusions and Recommendations

It is concluded that these procedures will be helpful in ensuring and establishing the quality of the data when sampling according to the requirements of Method 28. This will be beneficial for data producing activities including research and development, and as an aid for certification and auditing. This document may be used in combination with Method 28 for designing an individualized quality assurance program.

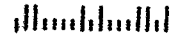
Copies of the checklists and summary activity matrices provided herein may be supplied to testing personnel to ensure that the described quality assurance procedures are followed. Also, copies of blank data sheets can aid the user in ensuring and establishing data quality in sampling activities.

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The complete report, entitled "Quality Assurance Procedures: Method 28 Certification and Auditing of Wood Heaters," (Order No. PB 89-198 287/AS; Cost: \$21.95, subject to change) will be available only from:

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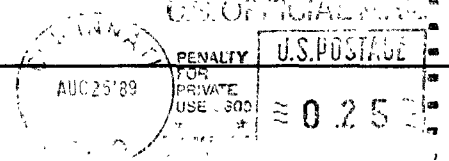


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