Designation: D 3685/D 3685M – 98

Standard Test Methods for Sampling and Determination of Particulate Matter in Stack Gases[1]

This standard is issued under the fixed designation D 3685/D 3685M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 These test methods describe procedures to determine the mass emission rates of particulate matter and collected residue in gaseous streams by in-stack test methods (Test Method A) or out-of-stack test methods (Test Method B).

1.2 These test methods are suitable for measuring particulate matter and collected residue concentrations.

1.3 These test methods include a description of equipment and procedures to be used for obtaining samples from effluent ducts and stacks, a description of equipment and procedures for laboratory analysis, and a description of procedures for calculating results.

1.4 These test methods are applicable for sampling particulate matter and collected residue in wet (Test Method A or B) or dry (Test Method A) streams before and after particulate matter control equipment, and for determination of control device particulate matter collection efficiency.

1.5 These test methods are also applicable for determining compliance with regulations and statutes limiting particulate matter existing in stack gases when approved by federal or state agencies.

1.6 The particulate matter and collected residue samples collected by these test methods may be used for subsequent size and chemical analysis.

1.7 These test methods describe the instrumentation, equipment, and operational procedures, including site selection, necessary for sampling and determination of particulate mass emissions. These test methods also include procedures for collection and gravimetric determination of residues collected in an impinger-condenser train. The sampling and analysis of particulate matter may be performed independently or simultaneously with the determination of collected residue.

1.8 These test methods provide for the use of optional filter designs and filter material as necessary to accommodate the wide range of particulate matter loadings to which the test methods are applicable.

1.9 Stack temperatures limitation for Test Method A is approximately 400°C (752°F) and for Test Method B is 815°C (1500°F).

1.10 A known limitation of these test methods concerns the use of collected residue data. Since some collected residues can be formed in the sample train by chemical reaction in addition to condensation, these data should not be used without prior characterization (see 4.4.1).

1.10.1 A second limitation concerns the use of the test methods for sampling gas streams containing fluoride, or ammonia or calcium compounds in the presence of sulfur dioxide and other reactive species having the potential to react within the sample train.

1.10.2 A suspected but unverified limitation of these test methods concerns the possible vaporization and loss of collected particulate organic matter during a sampling run.

1.11 The values stated in either SI units or inch-pound units are to be regarded separately as standard within the text. The inch-pound units are shown in parentheses. The values stated in each system are not exact equivalents; therefore each system shall be used independently of the other. Combining values from the two systems may result in nonconformance to this standard.

1.12 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 1071 Test Methods for Volumetric Measurement of Gaseous Fuel Samples[2]

D 1193 Specification for Reagent Water[3]

D 1356 Terminology Relating to Sampling and Analysis of Atmospheres[4]

D 2986 Practice for Evaluation of Air Assay Media by the

[1] These test method are under the jurisdiction of ASTM Committee D-22 on Sampling and Analysis of Atmospheres and are the direct responsibility of Subcommittee D22.03 on Ambient Atmospheres and Source Emissions.

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[2] *Annual Book of ASTM Standards*, Vol 05.05.

[3] *Annual Book of ASTM Standards*, Vol 11.01.

[4] *Annual Book of ASTM Standards*, Vol 11.03.

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