Designation: D 6331 – 98

Standard Test Method for Determination of Mass Concentration of Particulate Matter from Stationary Sources at Low Concentrations (Manual Gravimetric Method)[1]

This standard is issued under the fixed designation D 6331; 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 This test method[2] covers a method for the measurement of particulate matter (dust) concentration in emission gases in the concentrations below 20 mg/m^3 standard conditions, with special emphasis around 5 mg/m^3.

1.2 To meet the requirements of this test method, the particulate sample is weighed to a specified level of accuracy. At low dust concentrations, this is achieved by:

1.2.1 Exercising extreme care in weighing,

1.2.2 Extending the sampling time at conventional sampling rates, or

1.2.3 Sampling at higher rates at conventional sampling times (high-volume sampling).

1.3 This test method differs from Test Method D 3685/D 3685M by requiring the mass measurement of filter blanks, specifying weighing procedures, and requiring monitoring of the flue gas flow variability over the testing period. It requires that the particulate matter collected on the sample filter have a mass at least five times a positive mass difference on the filter blank. High volume sampling techniques or an extension of the sampling time may be employed to satisfy this requirement.

1.4 This test method may be used for calibration of automated monitoring systems (AMS). If the emission gas contains unstable, reactive, or semi-volatile substances, the measurement will depend on the filtration temperature, and in-stack methods may be more applicable than out-stack methods for the calibration of automated monitoring systems.

1.5 *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 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 Monodisperse DOP (Dioctyl Phthalate) Smoke Test[4]

D 3154 Test Method for Average Velocity in a Duct (Pitot Tube Method)[4]

D 3631 Test Methods for Measuring Surface Atmospheric Pressure[4]

D 3670 Guide for Determination of Precision and Bias of Methods of Committee D-22[4]

C 3685/D 3685M Test Methods for Sampling and Determination of Particulate Matter in Stack Gases[4]

D 3796 Practice for Calibration of Type S Pitot Tubes[4]

D 4536 Test Method for High-Volume Sampling for Solid Particulate Matter and Determination of Particulate Emissions[4]

E 1 Specification for ASTM Thermometers[5]

2.2 *ISO Standards:*[6]

ISO 5725 Precision of test methods — Determination of repeatability and reproducibility by inter-laboratory tests

ISO 9096 Stationary source emissions — Determination of concentration and mass flow rate of particulate material in gas-carrying ducts. Manual gravimetric method

ISO 10780 Stationary source emissions — Measurement of velocity and volume flow rate of gas stream in ducts

3. Terminology

3.1 For definitions of terms used in this test method, refer to Terminology D 1356.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *filtration temperature*—the temperature of the sampled gas immediately downstream of the filter.

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

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[2] This test method is based on ISO/CD 12141.3, "Stationary Source Emissions—Determination of Mass Concentration of Particulate Matter (Dust) at Low Concentrations—Manual Gravimetric Method", available from International Organization for Standardization, Casa Postale 56, CH-1211, Geneva Switzerland.

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

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

[5] *Annual Book of ASTM Standards*, Vol 14.03.

[6] Available from International Organization for Standardization, Casa Postals 56, CH-1211, Geneva, Switzerland.

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