



Designation: D5835 – 20

Standard Practice for Sampling Stationary Source Emissions for the Automated Determination of Gas Concentrations¹

This standard is issued under the fixed designation D5835; 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 practice² covers procedures and equipment that will permit representative sampling for the automated determination of gas concentrations of effluent gas streams with limitations as described below. The application is limited to the determination of oxygen (O_2), carbon dioxide (CO_2), carbon monoxide (CO), sulfur dioxide (SO_2), nitric oxide (NO), nitrogen dioxide (NO_2), and total oxides of nitrogen (NO_x).

1.2 Velocity measurements are required to determine the mass flow rates of gases. This is not included in this practice.

1.3 There are some combustion processes and conditions that may limit the applicability of this practice. Where such conditions exist, caution and competent technical judgment are required, especially when dealing with any of the following:

1.3.1 Corrosive or highly reactive components,

1.3.2 High vacuum, high pressure, or high temperature gas streams,

1.3.3 Wet flue gases,

1.3.4 Fluctuations in velocity, temperature, or concentration due to uncontrollable variation in the process,

1.3.5 Gas stratification due to the non-mixing of gas streams,

1.3.6 Measurements made using environmental control devices, and

1.3.7 Low levels of gas concentrations.

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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, health, and environmental practices and deter-*

mine the applicability of regulatory limitations prior to use. For more specific safety precautions, refer to 5.1.4.8, 5.2.1.6, and 6.2.2.1.

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*³

D1356 Terminology Relating to Sampling and Analysis of Atmospheres

D1608 Test Method for Oxides of Nitrogen in Gaseous Combustion Products (Phenol-Disulfonic Acid Procedures)

D3154 Test Method for Average Velocity in a Duct (Pitot Tube Method)

2.2 *Other Document:*

40 CFR Part 60 Standards of Performance for Stationary Sources, Appendix A, Test Methods 2, 3, 3a, 6, 6c, 7, 7e, and 10⁴

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this practice, refer to Terminology **D1356**.

4. Summary of Practice

4.1 This practice describes representative duct or stack gas sampling, including both extractive and non-extractive sampling. In extractive sampling, gases are conditioned to remove aerosols, particulate matter, and other interfering substances before being conveyed to instruments. In non-extractive

¹ This practice is under the jurisdiction of ASTM Committee **D22** on Air Quality and is the direct responsibility of Subcommittee **D22.03** on Ambient Atmospheres and Source Emissions.

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² This practice is based on ISO 10396, “Stationary source emissions—Sampling for the automated determination of gas concentrations,” available from International Organization for Standardization, Casa Postale 56, CH-1211, Geneva, Switzerland.

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard’s Document Summary page on the ASTM website.

⁴ Available from U.S. Government Printing Office, Superintendent of Documents, 732 N. Capitol St., NW, Washington, DC 20401-0001, <http://www.access.gpo.gov>.