



Designation: D 6216 – 98

Standard Practice for Opacity Monitor Manufacturers to Certify Conformance with Design and Performance Specifications¹

This standard is issued under the fixed designation D 6216; 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 practice covers the procedure for certifying continuous opacity monitors. It includes design and performance specifications, test procedures, and quality assurance requirements to ensure that continuous opacity monitors meet minimum design and calibration requirements, necessary in part, for accurate opacity monitoring measurements in regulatory environmental opacity monitoring applications subject to 10 % or higher opacity standards.

1.2 This practice applies specifically to the original manufacturer, or to those involved in the repair, remanufacture, or resale of opacity monitors.

1.3 Test procedures that specifically apply to the various equipment configurations of component equipment that comprise either a transmissometer, an opacity monitor, or complete opacity monitoring system are detailed in this practice.

1.4 The specifications and test procedures contained in this practice exceed that of the United States Environmental Protection Agency (USEPA). For each opacity monitor or monitoring system that the manufacturer demonstrates conformance to this practice, the manufacturer may issue a certificate that states that that opacity monitor or monitoring system conforms with all of the applicable design and performance requirements of 40 CFR 60, Appendix B, Performance Specification 1 except those for which tests are required after installation.

2. Referenced Documents

2.1 ASTM Standards:

D 1356 Terminology Relating to Sampling and Analysis of Atmospheres²

2.2 U.S. Environmental Protection Agency Document:³
40 CFR 60 Appendix B, Performance Specification 1

2.3 Other Documents:

¹ This practice 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 Atmospheres and Source Emissions.

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² Annual Book of ASTM Standards, Vol 11.03.

³ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

ISO/DIS 9004 Quality Management and Quality System Elements-Guidelines⁴

ANSI/NCSL Z 540-1-1994 Calibration Laboratories and Measuring Equipment - General Requirements⁴

NIST 260-116 - Filter calibration procedures⁵

3. Terminology

3.1 For terminology relevant to this practice, see Terminology D 1356.

3.2 Definitions of Terms Specific to This Standard:

Analyzer Equipment

3.2.1 *opacity, n*—measurement of the degree to which particulate emissions reduce (due to absorption, reflection, and scattering) the intensity of transmitted photopic light and obscure the view of an object through ambient air, an effluent gas stream, or an optical medium, of a given pathlength.

3.2.1.1 *Discussion*—Opacity (Op), expressed as a percent, is related to transmitted light, (T) through the equation:

$$Op = (1 - T) (100). \quad (1)$$

3.2.2 *opacity monitor, n*—an instrument that continuously determines the opacity of emissions released to the atmosphere.

3.2.2.1 *Discussion*—An opacity monitor includes a transmissometer that determines the *in-situ* opacity, a means to correct opacity measurements to equivalent single-pass opacity values that would be observed at the pathlength of the emission outlet, and all other interface and peripheral equipment necessary for continuous operation.

3.2.2.2 *Discussion*—An opacity monitor may include the following: (1) sample interface equipment such as filters and purge air blowers to protect the instrument and minimize contamination of exposed optical surfaces, (2) shutters or other devices to provide protection during power outages or failure of the sample interface, and (3) a remote control unit to facilitate monitoring the output of the instrument, initiation of

⁴ Available from American National Standards Institute, 11 W. 42nd St., 13th floor, New York, NY 10036.

⁵ Available from National Institute of Standards and Technology, Gaithersburg, MD 20899.