



Designation: D5503 – 24

Standard Practice for Natural Gas Sample-Handling and Conditioning Systems for Pipeline Instrumentation¹

This standard is issued under the fixed designation D5503; 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 sample-handling and conditioning systems for typical pipeline monitoring instrumentation (gas chromatographs, moisture analyzers, and so forth). The selection of the sample-handling and conditioning system depends upon the operating conditions and stream composition.

1.2 This practice is intended for single-phase mixtures that vary in composition. A representative sample cannot be obtained from a two-phase stream.

1.3 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

1.4 *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 determine the applicability of regulatory limitations prior to use.*

1.5 *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:²

D1142 Test Method for Water Vapor Content of Gaseous Fuels by Measurement of Dew-Point Temperature
D4150 Terminology Relating to Gaseous Fuels

2.2 Other Standards:

ANSI/API 2530 (AGA Report Number 3)³
AGA Report Number 8⁴
NACE Standard MR-01-75⁵

3. Terminology

3.1 Definitions:

3.1.1 For definitions of general terms used in D03 Gaseous Fuel standards, refer to Terminology D4150.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *density, n*—mass per unit volume of the substance being considered.

3.2.2 *lag time, n*—time required to transport the sample to the analyzer.

3.2.3 *sample probe, n*—device to extract a representative sample from the pipeline.

3.2.4 *system turnaround time, n*—the time required to transport the sample to the analyzer and to measure the desired components.

4. Significance and Use

4.1 A well-designed sample-handling and conditioning system is essential to the accuracy and reliability of pipeline instruments. Approximately 70 % of the problems encountered are associated with the sampling system.

5. Selection of Sample-Handling and Conditioning System

5.1 The sample-handling and conditioning system must extract a representative sample from a flowing pipeline, transport the sample to the analyzer, condition the sample to be compatible with the analyzer, switch sample streams and calibration gases, transport excess sample to recovery (or disposal), and resist corrosion by the sample.

¹ This practice is under the jurisdiction of ASTM Committee D03 on Gaseous Fuels and is the direct responsibility of Subcommittee D03.01 on Collection and Measurement of Gaseous Samples.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁴ Available from American Gas Association, 1515 Wilson Blvd., Arlington, VA 22209.

⁵ Available from NACE International (NACE), 1440 South Creek Dr., Houston, TX 77084-4906, <http://www.nace.org>.