



Designation: F307 – 13 (Reapproved 2020)

Standard Practice for Sampling Pressurized Gas for Gas Analysis¹

This standard is issued under the fixed designation F307; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This practice describes procedures for obtaining a sample of pressurized gas for gas analysis from a system or component.

1.2 The values stated in SI units are to be regarded as the standard.

1.3 *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.* For hazard statement, see Section 6.

1.4 *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

- F310 Practice for Sampling Cryogenic Aerospace Fluids
- G93 Guide for Cleanliness Levels and Cleaning Methods for Materials and Equipment Used in Oxygen-Enriched Environments

3. Terminology

3.1 *Definitions:*

3.1.1 *sample port*—the designated point in a system or component from which a representative gas sample may be taken.

¹ This practice is under the jurisdiction of ASTM Committee E21 on Space Simulation and Applications of Space Technology and is the direct responsibility of Subcommittee E21.05 on Contamination. ASTM Committee D02 on Petroleum Products and Lubricants maintains a continued interest in this practice and will make use of it in the future.

Current edition approved April 1, 2020. Published April 2020. Originally approved in 1966. Last previous edition approved in 2013 as F307 – 13. DOI: 10.1520/F0307-13R20.

² 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. Summary of Practice

4.1 *Evacuated Sample Vessel Procedure*—A sample pressure vessel is evacuated and sealed with a minimum vacuum pressure of 10^{-3} torr. The vessel is then attached to the designated pressurized sample port. The pressurized gas is allowed to enter the sample vessel until the pressure is equal to the pressure of the system or component. The pressure is secured and the sample vessel assigned for appropriate analysis.

4.2 *Purged Sample Vessel Procedure*—The pressurized gas sample port is opened to establish a low level purge. A sample vessel with valves opened at each end is attached to the pressurized sample port. The pressurized sample port is opened and the purge pressure is increased to completely purge the vessel prior to sample capture. The vessel valves and sample port valves are then closed and the sample vessel delivered for analysis.

5. Apparatus

NOTE 1—All apparatus used in the sample taking should be verified as cleaned and packaged within the requirements of the allowable contamination of the system.

5.1 *Connecting Lines*, rigid or flexible, pressure rated and identified within recognized safety codes.

5.2 *Miscellaneous Fittings*, as needed for sampling point adaptation.

5.3 *Tie-downs*, suitable for sample line restraint in accord with pressure, temperature, and recognized safety codes.

5.4 *Gas Sample Vessel*, rated for the appropriate maximum and minimum pressure for the gas analysis method to be used. This vessel should have valves at inlet and outlet to enable lockup of vacuum or pressure. (See Fig. 1.)

NOTE 2—The gas sample vessel capacity is selected in accord with desired sample volume. For evacuated vessel sampling, a recommended 8-L (500-in³) volume has been determined adequate to aerospace industry. Evacuated sample vessels should be helium leak tested prior to use.

6. Safety Hazards

6.1 Personnel must stand clear of exiting gas.

6.2 Ear protection must be used when gas flow approaches sonic velocity.