Designation: F 307 – 02

Standard Practice for Sampling Pressurized Gas for Gas Analysis[1]

This standard is issued under the fixed designation F 307; 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 Department of Defense.

1. Scope

1.1 This practice describes the procedure 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. The values given in parentheses are for information only.

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 and health practices and determine the applicability of regulatory limitations prior to use.* For hazard statement, see Section 5.

2. Terminology

2.1 *Definitions:*

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

3. Summary of Practice

3.1 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. 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, unless otherwise noted.

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

4.2 *Miscellaneous Fittings*, as needed for sampling point adaption.

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

4.4 *Gas Sample Vessel*, evacuated to a suitable 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.)

FIG. 1 Gas Sample Vessel.

NOTE 2—The gas sample vessel capacity is in accord with desired sample volume. A recommended 8-L (500-in^3) volume has been determined adequate to aerospace industry. The gas sample vessel must be pressure-rated for the system or component to be sampled.

5. Safety Hazards

5.1 Personnel must stand clear of exiting gas.

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

5.3 All lines and associated equipment must be connected and operated within the requirements of recognized safety codes.

6. Procedure

6.1 Establish and maintain a minimum purge at the sample port.

6.2 Connect one end of a suitable connecting line to the sample port, and continue to purge.

6.3 Install tie-down as required for safety code.

6.4 Continue to purge and connect the other end of sample line to sample vessel inlet.

6.5 Open sample vessel inlet valve.

6.6 Increase purge until system pressure is equalized in sample vessel.

6.7 Open outlet valve and purge for 1 s, then close and secure outlet valve.

6.8 Close and secure inlet valve.

6.9 Reduce system pressure to minimum purge and disconnect sample line from sample vessel.

[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.

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6.10 Disconnect sample line from sample port and secure system.

6.11 Identify sample vessel and contents to required safety codes and analysis procedure.

6.12 Deliver sample vessel to analysis facility for required analyses, such as impurities by gas chromatography, particle counts, moisture content, or other desired properties.

7. Keywords

7.1 gas analysis; pressurized gas