Designation: F309 – 04 (Reapproved 2010)

Standard Practice for Liquid Sampling of Noncryogenic Aerospace Propellants[1]

This standard is issued under the fixed designation F309; 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 procedures for obtaining a sample of noncryogenic aerospace propellant. Two procedures are covered as follows:

Procedure 1—Closed System (Section 6), and

Procedure 2—Open-End Procedure (Section 7).

1.2 *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 statements see Sections 4 and 5.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

F311 Practice for Processing Aerospace Liquid Samples for Particulate Contamination Analysis Using Membrane Filters

3. Summary of Practice

3.1 Samples are withdrawn from the system by (*1*) a closed vessel capture, and (*2*) an open-end vessel (see Fig. 1). Both procedures are practical for most liquid aerospace propellants not excessively corrosive or toxic.

4. Apparatus

4.1 *Stainless Steel Pressure Sampling Cylinders,* 1-L capacity, equipped with stainless steel valves on each end.

4.1.1 **Caution**—Pressure sampling cylinders must be marked for the liquid being sampled. Cylinders for one material must not be interchanged with sampling cylinders of other materials because of the possibility of incompatibility.

4.2 *Full Protective Suits.*

4.2.1 **Caution**—Due to the toxic and corrosive nature of most propellent fluids and their vapors, extreme care must be exercised in handling. Full protective suits must be worn when sampling these fluids.

4.3 *Polyethylene Wash Bottle,* 1-L capacity, filled with demineralized water, filtered in the manner described in Practice F311.

4.4 *Stainless Steel Bucket.*

4.5 *Miscellaneous Fittings,* as needed for sample point adaption.

5. Hazards

5.1 Care should be taken when handling propellants since most of them are toxic to some degree. Care should also be taken when sampling fluids from a system under dynamic conditions.

PROCEDURE 1—CLOSED SYSTEM

6. Procedure

6.1 Sampling cylinders must be clean, particulate-controlled in accordance with system requirements, and have a partial vacuum of 10 % of atmospheric pressure.

6.2 After removing protective caps, connect both ends of the sampling cylinder to the system sampling ports, using fittings as necessary.

6.3 Open both sampling valves and both sampling cylinder valves, and allow fluid to flow through the sampling cylinder for 10 min.

6.4 Close all four valves downstream side first, and remove the sampling cylinder from the system.

6.5 Rinse the valve ends with demineralized water filtered through a 0.8 to 2.0-µm absolute membrane.

6.6 Replace the protective caps on the sampling cylinder and sampling valves.

6.7 Submit the full sampling cylinder for analysis.

PROCEDURE 2—OPEN-END PROCEDURE

7. Procedure

7.1 Sampling cylinders must be clean and particulate-controlled in accordance with system requirements, and have a vacuum of 10 % of atmospheric pressure.

[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.

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[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.

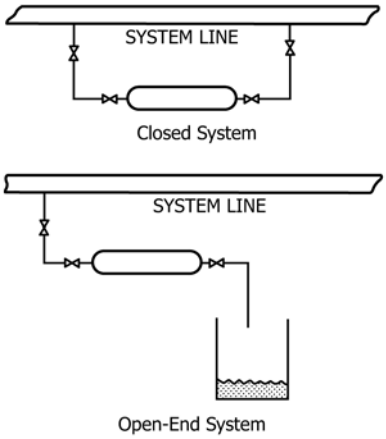

FIG. 1 Two Systems for Obtaining a Sampling of Noncryogenic Aerospace Fluid

7.2 After removing protective caps, connect the sampling cylinder to the sampling valve of the system and inlet valve of the sampling cylinder.

7.3 Open the sampling valve of the system and inlet valve of the sampling cylinder.

7.4 Slowly open the outlet valve of the sampling cylinder and catch the overflow in a bucket. Adjust the valve until the cylinder is full.

7.5 Close all three valves.

7.6 Remove the sampling cylinder from system.

7.7 Rinse the valve ends with demineralized water filtered through a 0.8 to 2.0-μm absolute membrane.

7.8 Replace the protective caps on the cylinder and sampling valves.

7.9 Submit the full sampling cylinder for analysis.

8. Precision and Bias

8.1 Neither the precision nor the bias for this practice has been determined.

9. Keywords

9.1 aerospace propellants; fluid sampling; sampling