Designation: F311 – 08 (Reapproved 2013)

Standard Practice for Processing Aerospace Liquid Samples for Particulate Contamination Analysis Using Membrane Filters[1]

This standard is issued under the fixed designation F311; 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 processing of liquids in preparation for particulate contamination analysis using membrane filters and is limited only by the liquid-to-membrane filter compatibility.

1.2 The practice covers the procedure for filtering a measured volume of liquid through a membrane filter. When this practice is used, the particulate matter will be randomly distributed on the filter surface for subsequent contamination analysis methods.

1.3 The practice describes procedures to allow handling particles in the size range between 2 and 1000 µm with minimum losses during handling.

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D287 Test Method for API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method)

D1078 Test Method for Distillation Range of Volatile Organic Liquids

D1193 Specification for Reagent Water

D1353 Test Method for Nonvolatile Matter in Volatile Solvents for Use in Paint, Varnish, Lacquer, and Related Products

D1836 Specification for Commercial Hexanes

D2021 Specification for Neutral Detergent, 40 Percent Alkylbenzene Sulfonate Type (Withdrawn 2000)[3]

F302 Practice for Field Sampling of Aerospace Fluids in Containers

F303 Practices for Sampling for Particles in Aerospace Fluids and Components

F312 Test Methods for Microscopical Sizing and Counting Particles from Aerospace Fluids on Membrane Filters

3. Definition

3.1 *filtered liquid dispenser*—as used in this practice, a dispenser capable of delivering rinse liquid through a filter with pore size no larger than half the size of the smallest particle being considered for measurement.

4. Significance and Use

4.1 This practice provides for the processing of liquid samples obtained in accordance with Practice F302 and Practices F303. It will provide the optimum sample processing for visual contamination methods such as Method F312, and Test Method F314.

5. Apparatus and Materials

5.1 *Filtration Funnel*—The funnel opening in contact with the membrane shall be approximately 35.0 mm in inside diameter. The effective area shall be calibrated. If the funnel is to be used for measuring the sample volume, the funnel shall be calibrated within ±2 % of the required volume.

5.2 *Membrane Filter Support*—Either a fritted-glass, sintered-metal, polyphenyl-sulfone or stainless steel screen may be used. The support shall be so designed as to enable attachment to a vacuum flask.

5.3 *Vacuum Flask.*

5.4 *Funnel-Holding Device*—A provision should be made for the dissipation of static electricity from the funnel.

5.5 A clean bench or hood, supplied with unidirectional flow filtered air, in which uncovered components may be placed.

5.6 *Vacuum Source*—Minimum vacuum gage reading of 61 kPa (or other metric units acceptable to ASTM).

5.7 *Forceps,* unserrated tips.

5.8 *Filtered Liquid Dispenser.*

[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.

[3] The last approved version of this historical standard is referenced on www.astm.org.