



Designation: F311 – 08 (Reapproved 2020)

Standard Practice for Processing Aerospace Liquid Samples for Particulate Contamination Analysis Using Membrane Filters¹

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.

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

[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 Sol-](#)

[vents 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[D2021 Specification for Neutral Detergent, 40 Percent Alkylbenzene Sulfonate Type \(Withdrawn 2000\)](#)³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 $\pm 2\%$ 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.

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.