



Designation: D4898 – 90 (Reapproved 2005)

# Standard Test Method for Insoluble Contamination of Hydraulic Fluids by Gravimetric Analysis<sup>1</sup>

This standard is issued under the fixed designation D4898; 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 ( $\epsilon$ ) 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 test method covers the determination of insoluble contamination in hydraulic fluids by gravimetric analyses. The contamination determined includes both particulate and gel-like matter, organic and inorganic, which is retained on a membrane filter disk of pore diameter as required by applicable specifications (usually 0.45  $\mu\text{m}$  or 0.80  $\mu\text{m}$ ).

1.2 To indicate the nature and distribution of the particulate contamination, the gravimetric method should be supplemented by occasional particle counts of typical samples in accordance with Test Method F312.

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

1.4 *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 a specific warning statement, see 6.1.

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

A555/A555M Specification for General Requirements for Stainless Steel Wire and Wire Rods

D1836 Specification for Commercial Hexanes

D2021 Specification for Neutral Detergent, 40 Percent Alkylbenzene Sulfonate Type

E319 Practice for the Evaluation of Single-Pan Mechanical Balances

F302 Practice for Field Sampling of Aerospace Fluids in Containers

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D02 on Petroleum and Petroleum Products and is the direct responsibility of Subcommittee D02.N0 on Hydraulic Fluids.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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

F314 Test Methods for Identification of Metallic and Fibrous Contaminants in Aerospace Fluids

### 2.2 Military Standard:

MIL-C-81302 C Cleaning Compound Solvent Trichlorotrifluoroethane<sup>3</sup>

## 3. Summary of Test Method

3.1 The insoluble contamination is determined by passing a given quantity of a fluid sample through a membrane filter disk and measuring the resultant increase in the weight of the filter. The fluid sample is drawn through the filter by a vacuum and the insoluble contamination is collected on the surface of the filter. In addition, the filter disk is microscopically scanned for excessively large particles, fibers, or other unusual conditions.

## 4. Significance and Use

4.1 This test method indicates and measures the amount of insoluble contamination of hydraulic fluids. Minimizing the levels of insoluble contamination of hydraulic fluids is essential for the satisfactory performance and long life of the equipment. Insoluble contamination can not only plug filters but can damage functional system components resulting in wear and eventual system failure.

## 5. Apparatus

5.1 *Microbalance*, accurate to 0.005 mg, and the zero shall not drift more than 0.005 mg during the test period. The rated accuracy shall be obtainable by personnel actually making the weighings, under actual conditions of use and shall be verified in accordance with Practice E319.

5.2 *Membrane Filter Support*, fritted glass, sintered metal, or stainless steel screen, to support 25-mm or 47 to 51-mm membrane filters. The support shall be designed to enable attachment of a vacuum flask.

<sup>3</sup> Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098