



Designation: D 1401 – 9802

An American National Standard

## Standard Test Method for Water Separability of Petroleum Oils and Synthetic Fluids<sup>1</sup>

This standard is issued under the fixed designation D 1401; 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.*

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D-2 D02 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.C0.02 on Corrosion and Water/Air Separability.

Current edition approved July 10, 1998; 2002. Published October 1998. December 2002. Originally published as D 1401—64, approved in 1964. Last previous edition approved in 1998 as D 1401—968.

### 1. Scope

1.1 This test method covers measurement of the ability of petroleum oils or synthetic fluids to separate from water.

NOTE 1—Although developed specifically for steam-turbine oils having viscosities of 28.8–90 cSt ( $\text{mm}^2/\text{s}$ ) at 40°C, this test method can be used to test oils of other types having various viscosities and synthetic fluids. It is recommended, however, that the test temperature be raised to  $82 \pm 1^\circ\text{C}$  when testing products more viscous than 90 cSt ( $\text{mm}^2/\text{s}$ ) at 40°C. For higher viscosity oils where there is insufficient mixing of oil and water, Test Method D 2711, is recommended.

Other test temperatures such as 25°C can also be used.

When testing synthetic fluids whose relative densities are greater than that of water, the procedure is unchanged, but it should be noted that the water will probably float on the emulsion or liquid.

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 specific precautionary statements, see 6.3, 8.1, 6.3-6.5.

### 2. Referenced Documents

2.1 *ASTM Standards:*

D 665 Test Method for Rust-Preventing Characteristics of Inhibited Mineral Oil in the Presence of Water<sup>2</sup>

~~D 1141~~ Specification 1141 Practice for the Preparation of Substitute Ocean Water<sup>3</sup>

D 1193 Specification for Reagent Water<sup>4</sup>

D 2711 Test Method for Demulsibility Characteristics of Lubricating Oils<sup>2</sup>

D 4057 Practice for Manual Sampling of Petroleum and Petroleum Products<sup>5</sup>

### 3. Summary of Test Method

3.1 A test specimen consisting of a 40-mL sample and a 40-mL quantity of distilled water (Note 3) are stirred for 5 min at 54°C (Note 1) in a graduated cylinder. The time required for the separation of the emulsion thus formed is recorded either after every 5 min or at the specification time limit. If complete separation or emulsion reduction to 3 mL or less does not occur after standing for 30 min or some other specification time limit, the volumes of oil (or fluid), water, and emulsion remaining at the time are reported.

### 4. Significance and Use

4.1 This test method provides a guide for determining the water separation characteristics of oils subject to water contamination and turbulence. It is used for specification of new oils and monitoring of in-service oils.

<sup>2</sup> Annual Book of ASTM Standards, Vol 05.01.

<sup>3</sup> Annual Book of ASTM Standards, Vol 11.02.

<sup>4</sup> Annual Book of ASTM Standards, Vol 11.01.

<sup>5</sup> Annual Book of ASTM Standards, Vol 05.02.