



Designation: D7603 – 23

# Standard Test Method for Determination of Storage Stability and Compatibility in Automotive Gear Oils<sup>1</sup>

This standard is issued under the fixed designation D7603; 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.

## 1. Scope

1.1 This test method covers the determination of storage stability characteristics and the compatibility of automotive gear lubricants when blended with reference lubricants. The purpose of the test is to determine if performance-enhancing additives separate out under defined conditions.

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

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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:*<sup>2</sup>

**D235** Specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent)

**D1193** Specification for Reagent Water

**D4175** Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants

**D5760** Specification for Performance of Manual Transmission Gear Lubricants

**E542** Practice for Gravimetric Calibration of Laboratory Volumetric Instruments

**E1272** Specification for Laboratory Glass Graduated Cylinders

2.2 *SAE Standards:*<sup>3</sup>

**J2360** Lubricating Oil, Gear Multipurpose (Metric) Military Use

2.3 *Federal Test Method Standard:*<sup>4</sup>

**FED-STD-791/3440.1** Storage Solubility Characteristics of Universal Gear Lubricants

**FED-STD-791/3440.2** Compatibility Characteristics of Universal Gear Lubricants

## 3. Terminology

3.1 *Definitions:*

3.1.1 *calibrate, v*—to determine the indication or output of a measuring device (for example, thermometer, manometer, engine) with respect to that of a standard.

3.1.2 *candidate oil, n*—an oil that is intended to have the performance characteristics necessary to satisfy a specification and is to be tested against that specification. **D4175**

3.1.3 *reference oil, n*—an oil of known performance characteristics, used as a basis for comparison.

3.1.3.1 *Discussion*—Reference oils are used to calibrate testing facilities, to compare the performance of other oils, or to evaluate other materials (such as seals) that interact with oils. **D4175**

3.1.4 *test oil, n*—any oil subjected to evaluation in an established procedure. **D4175**

## 4. Summary of Test Method

4.1 Separation of the performance-enhancing additives in a test oil during storage is determined by heating it to 120 °C, storing at room temperature for 30 days, and making a qualitative observation as to whether any material has separated out.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.B0.01 on Passenger Car Engine Oils.

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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.

<sup>3</sup> Available from SAE International (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001, <http://www.sae.org>.

<sup>4</sup> Available online at [www.assistdocs.com](http://www.assistdocs.com) (search for FED-STD-791 in the document ID field or from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://dodssp.daps.dla.mil>).