Designation: D5662 – 16

Standard Test Method for Determining Automotive Gear Oil Compatibility with Typical Oil Seal Elastomers[1]

This standard is issued under the fixed designation D5662; 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 test method[2] covers the determination of the compatibility of automotive gear oils with specific nitrile, polyacrylate, and fluoroelastomer oil seal materials.

1.2 Users of this test method should obtain Test Methods D412, D471, and D2240 and become familiar with their use before proceeding with this test method.

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

2. Referenced Documents

2.1 *ASTM Standards:*[3]

D412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension

D471 Test Method for Rubber Property—Effect of Liquids

D2240 Test Method for Rubber Property—Durometer Hardness

D5704 Test Method for Evaluation of the Thermal and Oxidative Stability of Lubricating Oils Used for Manual Transmissions and Final Drive Axles

D5760 Specification for Performance of Manual Transmission Gear Lubricants

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

2.2 *SAE Standard:*[4]

J2360 Lubricating Oil, Gear Multipurpose (Metric) Military Use

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *dumbbell, n*—the specific cut shape (Die C) of an elastomer as explained in the section on dumbbell specimens in Test Methods D412.

3.1.2 *formulation, n*—the specific chemical composition used in manufacturing a seal elastomer or a reference oil.

3.1.3 *percent ultimate elongation, n*—the stretch length at rupture of an elastomer dumbbell oil-aged by running this procedure minus the rupture stretch length of an untested dumbbell, all divided by rupture stretch length of the untested dumbbell and then multiplied by 100.

3.1.4 *percent volume change, n*—the change in volume of a test specimen as explained in the procedure for change in volume in Test Method D471.

4. Summary of Test Method

4.1 Non-reference oils are tested using a modified version of Test Method D471 on specific elastomer compounds. Measured quantities are percent ultimate elongation changes (further referred to as just percent elongation changes), durometer Type A hardness changes, and percent volume changes. Reference oils are run concurrently in the same oil bath to measure consistency from one test to another.

4.2 The duration of these tests is 240 h. The reference oils are available from the ASTM Test Monitoring Center (TMC).[5] The seal materials are available through a Central Parts Distributor (CPD).[6]

[1] 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.B0.03 on Automotive Gear Lubricants & Fluids.

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[2] Until the next revision of this test method, the ASTM Test Monitoring Center will update changes in this test method by means of Information Letters; these can be obtained from the ASTM Test Monitoring Center, 6555 Penn Ave., Pittsburgh, Pa 15206-4489. Attention: Administrator. This edition incorporates revisions in all Information Letters through No. 15–1.

[3] 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.

[4] Available from Society of Automotive Engineers (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001, http://www.sae.org.

[5] Reference oils are available from the ASTM Test Monitoring Center, 6555 Penn Ave., Pittsburgh, PA 15206-4489.

[6] The Central Parts Distributor for this procedure is Test Engineering Inc., 12758 Cimarron Path, Suite 102, San Antonio, TX 78249.

***A Summary of Changes section appears at the end of this standard**

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