Designation: D4289 – 13 (Reapproved 2014)$^{\varepsilon 1}$

Standard Test Method for Elastomer Compatibility of Lubricating Greases and Fluids[1]

This standard is issued under the fixed designation D4289; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

ε[1] NOTE—AMS 3217/3B references were updated editorially in October 2014.

1. Scope

1.1 This test method evaluates the compatibility of lubricating greases and fluids with coupons cut from standard elastomer sheets (Practice D3182) or, optionally, from SAE Specification AMS 3217/2C (NBR-L) and AMS 3217/3B (CR) sheets. Compatibility is evaluated by determining the changes in volume and Durometer A hardness that occur when elastomer coupons are totally immersed in a lubricant sample for 70 h at either 100 or 150°C or as required by the lubricant specification.

1.1.1 Some lubricant specifications may require different test conditions, such as longer durations or lower or higher temperatures. In such instances, the repeatability and reproducibility values stated in Section 12 do not apply, and the user and supplier should agree on acceptable limits of precision.

NOTE 1—The scope of this test method now includes the evaluation of the elastomer compatibility of both lubricating fluids and greases. Testing of fluids was not included in Test Method D4289–95 and earlier versions.

1.2 This test method can also be used as a guide to evaluate the compatibility of greases with rubber products not in standard sheet form (Practice D3183).

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

1.3.1 *Exception*—When listed, Durometer A units shall 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 specific warning statements, see 8.4 – 8.6.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D217 Test Methods for Cone Penetration of Lubricating Grease

D297 Test Methods for Rubber Products—Chemical Analysis

D412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension

D471 Test Method for Rubber Property—Effect of Liquids

D1193 Specification for Reagent Water

D2240 Test Method for Rubber Property—Durometer Hardness

D3182 Practice for Rubber—Materials, Equipment, and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets

D3183 Practice for Rubber—Preparation of Pieces for Test Purposes from Products

D4175 Terminology Relating to Petroleum, Petroleum Products, and Lubricants

D4950 Classification and Specification for Automotive Service Greases

2.2 *Federal Standards:*[3]

Federal Test Method Standard 791C, Method 3603.5, Swelling of Synthetic Rubbers

2.3 *U.S. Air Force Specifications:*[4]

USAF-539 Specification Bulletin for Standard Elastomer Stocks

[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.G0.01 on Chemical and General Laboratory Tests.

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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] Available from Standardization Documents Order Desk, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

[4] USAF-539 is obsolete, but reproductions have been filed at ASTM International Headquarters and may be obtained by requesting Research Report RR:D02-1165.

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