



Designation: D7594 – 16

Standard Test Method for Determining Fretting Wear Resistance of Lubricating Greases Under High Hertzian Contact Pressures Using a High-Frequency, Linear-Oscillation (SRV) Test Machine¹

This standard is issued under the fixed designation D7594; 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 covers a procedure for determining the lubricating action of greases in order to prevent “fretting” wear under linear oscillation with associated low strokes and high Hertzian contact pressures under high-frequency linear-oscillation motion using the SRV test machine. By performing additional, nonmandatory extreme-pressure tests in accordance with Test Method **D5706**, the test grease should be shown to be able to withstand a Hertzian contact pressure of at least 2200 MPa without adhesive failure.

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

2. Referenced Documents

2.1 ASTM Standards:²

- A295/A295M** Specification for High-Carbon Anti-Friction Bearing Steel
- D217** Test Methods for Cone Penetration of Lubricating Grease
- D235** Specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent)
- D4175** Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants
- D5706** Test Method for Determining Extreme Pressure Properties of Lubricating Greases Using a High-

Frequency, Linear-Oscillation (SRV) Test Machine

D6425 Test Method for Measuring Friction and Wear Properties of Extreme Pressure (EP) Lubricating Oils Using SRV Test Machine

D7421 Test Method for Determining Extreme Pressure Properties of Lubricating Oils Using High-Frequency, Linear-Oscillation (SRV) Test Machine

D7755 Practice for Determining the Wear Volume on Standard Test Pieces Used by High-Frequency, Linear-Oscillation (SRV) Test Machine

E45 Test Methods for Determining the Inclusion Content of Steel

G40 Terminology Relating to Wear and Erosion

2.2 Other Standards:³

DIN 51834-3:2008-12 Testing of Lubricants—Tribological Test in Translatory Oscillation Apparatus—Part 3: Determination of Tribological Behaviour of Materials in Cooperation with Lubricants

DIN 51631:1999 Special-Boiling-Point Spirits—Requirements and Testing

DIN EN ISO 683-17 Heat-Treated Steels, Alloy Steels and Free-Cutting Steels—Part 17: Ball and Roller Bearing Steels [Replaces DIN 17230-1980]

DIN EN ISO 13565-2:1998 Geometrical Product Specifications (GPS)—Surface Texture: Profile Method—Surfaces Having Stratified Functional Properties—Part 2: Height Characterization Using the Linear Material Ratio Curve [Replaces DIN 4776-1990]

3. Terminology

3.1 Definitions:

3.1.1 *break-in, n—in tribology*, an initial transition process occurring in newly established wearing contacts, often accompanied by transients in coefficient of friction or wear rate, or both, that are uncharacteristic of the given tribological system’s long-term behavior. **G40**

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.G0.04** on Functional Tests - Tribology.

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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 Beuth Verlag GmbH (DIN-- DIN Deutsches Institut für Normung e.V.), Burggrafenstrasse 6, 10787, Berlin, Germany, <http://www.en.din.de>.

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