



Designation: D7421 – 16

Standard Test Method for Determining Extreme Pressure Properties of Lubricating Oils Using High-Frequency, Linear-Oscillation (SRV) Test Machine¹

This standard is issued under the fixed designation D7421; 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 extreme pressure properties of lubricating oils for hydraulics, gears, and engines under high-frequency linear-oscillation motion using the SRV test machine.

NOTE 1—This test method was developed and the international round robin tests were jointly performed with the DIN 51834 working group. This procedure is based on the 2005 revision of Test Method D5706 for greases and differs regarding the stroke length and the cleaning solvent.

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
- 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
- E45 Test Methods for Determining the Inclusion Content of Steel

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.L0 on Industrial Lubricants and Engineering Sciences of High Performance Fluids and Solids.

Current edition approved Oct. 1, 2016. Published February 2017. Originally approved in 2008. Last previous edition approved in 2011 as D7421 – 11. DOI: 10.1520/D7421-16.

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.

G40 Terminology Relating to Wear and Erosion

2.2 DIN Standards:³

- DIN 51631:1999–04 Mineral spirits; special boiling point spirits; requirements
- 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 linear material ratio curve [Replacement of DIN 4776:1990: Measurement of surface roughness; parameters R_K , R_{PK} , R_{VK} , M_{T1} , M_{T2} for the description of the material portion]

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, which are uncharacteristic of the given tribological system's long-term behavior. **G40**

3.1.2 *coefficient of friction*, μ or f , n —*in tribology*, the dimensionless ratio of the friction force (F) between two bodies to the normal force (N) pressing these bodies together. **G40**

3.1.3 *Hertzian contact area*, n —apparent area of contact between two nonconforming solid bodies pressed against each other, as calculated from Hertz's equations of elastic deformation published in 1881. **G40**

3.1.4 *Hertzian contact pressure*, n —magnitude of the pressure at any specified location in a Hertzian contact area, as calculated from Hertz's equations of elastic deformation. The Hertzian contact pressure can also be calculated and reported as maximum value $P_{\max}$ in the centre of the contact or as P_{average} as average over the total contact area. **D4175**

³ Available from Beuth Verlag GmbH (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