



Standard Test Method for Measuring Friction and Wear Properties of Extreme Pressure (EP) Lubricating Oils Using SRV Test Machine¹

This standard is issued under the fixed designation D 6425; 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.

INTRODUCTION

This test method represents the transformation of DIN 51834-2:1997. The DIN working group implemented changes at its annual meeting in Munich in September 2000. ASTM Committee D02 adopted these modifications as closely as possible. The DIN working group widens the scope of the standard to accommodate different test conditions and refines repeatability and reproducibility on the base of four international RR tests. It also introduces the wear volume as a tribological quantity.

1. Scope

1.1 This test method covers an extreme pressure (EP) lubricating oil's coefficient of friction and its ability to protect against wear when subjected to high-frequency, linear oscillation motion. The procedure is identical to that described in DIN 51834.

1.2 This test method can also be used to determine the ability of a non-EP lubricating oil to protect against wear and its coefficient of friction under similar test conditions.

1.3 The values stated in SI units are to be regarded as the standard. The values given in the parentheses are for information only.

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:

D 4175 Terminology Relating to Petroleum, Petroleum Products, and Lubricants²

G 40 Terminology Relating to Wear and Erosion³

2.2 DIN Standards:⁴

DIN 17230 Roller Bearing Steels

DIN 51631:1999 Mineral spirits; special boiling point spirits; requirements

DIN 51834 Tribological Test in the Translatory Oscillation Apparatus (Part 2: Determination of Friction and Wear Data for Lubricating Oils)

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)

2.3 ISO Standards:⁵

ISO 1250:1972 Mineral Solvents for Paints, White Spirits and Related Hydrocarbon Solvents

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. (*Synonym: run-in, wear-in*) **G 40**

3.1.2 *C.L.A., n—in measuring surface finish*, the arithmetic average of the absolute distances of all profile points from the mean line for a given distance.⁶

3.1.3 *coefficient of friction μ or f, n—in tribology*, the dimensionless ratio of the friction force (F_f) between two bodies to the normal force (F_n) pressing these bodies together.

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$$\mu = (F_f / F_n) \quad (1)$$

¹ This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.L0.11 on Tribological Properties of Industrial Fluid Lubricants.

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² Annual Book of ASTM Standards, Vol 05.02.

³ Annual Book of ASTM Standards, Vol 03.02.

⁴ Available from Deutsches Institut für Normung, Beuth Verlag GmbH, Burggrafenstrasse 6, D-10787 Berlin, Germany.

⁵ Available from International Organization for Standardization (ISO), 1 rue de Varembe, Case postale 56, CH-1211, Geneva 20, Switzerland.

⁶ Amstutz, Hu, "Surface Texture: The Parameters," Bulletin MI-TP-003-0785, Sheffield Measurement Division, Warner and Swazey, 1985, p. 21.