This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: D2782 – 17

Standard Test Method for Measurement of Extreme-Pressure Properties of Lubricating Fluids (Timken Method)[1]

This standard is issued under the fixed designation D2782; 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 the determination of the load-carrying capacity of lubricating fluids by means of the Timken Extreme Pressure Tester.

NOTE 1—This test method is suitable for testing fluids having a viscosity of less than about 5000 cSt (5000 mm^2/s) at 40 °C. For testing fluids having a higher viscosity, refer to Note 5 in 9.1.

1.2 The values stated in SI units are to be regarded as standard. Because the equipment used in this test method is available only in inch-pound units, SI units are omitted when referring to the equipment and the test specimens.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* Specific warning statements are given in 7.1, 7.2, 8.1, 8.2, 9.4, and 9.9.

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D2509 Test Method for Measurement of Load-Carrying Capacity of Lubricating Grease (Timken Method)

D4175 Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants

G40 Terminology Relating to Wear and Erosion

2.2 *ASTM Adjuncts:*

Photograph of Test Blocks Showing Scars[3]

3. Terminology

3.1 *Definitions:*

3.1.1 *extreme pressure (EP) additive, n, in a lubricant*—a substance that minimizes damage to metal surfaces in contact under high-stress rubbing conditions. **D4175**

3.1.2 *lubricant, n*—any substance interposed between two surfaces for the purpose of reducing friction or wear between them. **G40**

3.1.3 *scoring, n, in tribology*—a severe form of wear characterized by the formation of extensive grooves and scratches in the direction of sliding. **G40**

3.1.4 *wear, n*—damage to a solid surface generally involving progressive loss of material, due to relative motion between that surface and a contacting substance or substances. **G40**

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *load-carrying capacity of a lubricant*—as determined by this test method, the maximum load or pressure that can be sustained by the lubricant (when used in the given system under specific conditions) without failure of the sliding contact surfaces as evidenced by scoring or seizure or asperity welding.

3.2.2 *OK value, n*—as determined by this test method, the maximum mass (weight) added to the load lever weight pan, at which no scoring or seizure occurs.

3.2.3 *score value, n*—as determined by this test method, the minimum mass (weight) added to the load lever weight pan, at which scoring or seizure occurs.

3.2.3.1 *Discussion*—When the lubricant film is substantially maintained, a smooth scar is obtained on the test block, but when there is a breakdown of the lubricant film, scoring or surface failure of the test block takes place, as shown in Figs. 1 and 2. In its simplest and most recognized form, scoring is characterized by the furrowed appearance of a wide scar on the test block and by excessive pick-up of metal on the surface of

[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.L0.11 on Tribological Properties of Industrial Fluids and Lubricates.

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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 ASTM International Headquarters. Order Adjunct No. ADJD2509. Original adjunct produced in 1972.

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