



Standard Test Method for Evaluating Lubricity of Diesel Fuels by the Scuffing Load Ball-on-Cylinder Lubricity Evaluator (SLBOCLE)¹

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1. Scope

1.1 This test method evaluates the lubricity (load carrying ability) of diesel fuels using a scuffing load ball-on-cylinder lubricity evaluator (SLBOCLE).

1.2 This test method is applicable to middle distillate fuels, such as Grades Low Sulfur No. 1 D, Low Sulfur No. 2 D, No. 1 D, and No. 2 D diesel fuels, in accordance with Specification D 975; and other similar petroleum-based fuels which can be used in diesel engines.

NOTE 1—It is not known that this test method will predict the performance of all additive/fuel combinations. Additional work is underway to further establish this correlation and future revisions of the standard may be necessary once this work is complete.

1.3 The values stated in SI units are to 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.* Specific hazard statements are given in Section 7.

2. Referenced Documents

2.1 ASTM Standards:

D 329 Specification for Acetone²

D 445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)³

D 611 Test Method for Aniline Point and Mixed Aniline Point of Petroleum Products and Hydrocarbon Solvents³

D 770 Specification for Isopropyl Alcohol²

D 971 Test Method for Interfacial Tension of Oil Against Water by the Ring Method⁴

D 975 Specification for Diesel Fuel Oils³

D 1016 Test Method for Purity of Hydrocarbons from Freezing Points³

D 1133 Test Method for Kauri-Butanol Value of Hydrocarbon Solvents²

D 1218 Test Method for Refractive Index and Refractive Dispersion of Hydrocarbon Liquids³

D 1319 Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption³

D 4052 Test Method for Density and Relative Density of Liquids by Digital Density Meter⁵

D 4057 Practice for Manual Sampling of Petroleum and Petroleum Products⁵

D 4177 Practice for Automatic Sampling of Petroleum and Petroleum Products⁵

D 4306 Practice for Aviation Fuel Sample Containers for Tests Affected by Trace Contamination⁵

D 4367 Test Method for Benzene Content in Hydrocarbon Solvents by Gas Chromatography⁵

D 5001 Test Method for Measurement of Aviation Turbine Fuels by the Ball-on-Cylinder Lubricity Evaluator (BOCLE)⁵

D 6079 Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR)⁶

2.2 *American Iron and Steel Institute Standard:*⁷

AISI E-52100 Chromium Alloy Steel

2.3 *American National Standards Institute Standard:*⁸

ANSI B3.12, Metal Balls

2.4 *Society of Automotive Engineers Standard:*⁹

SAE 8720 Steel

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *lubricity, n*—a qualitative term describing the ability of a fluid to affect friction between, and wear to, surfaces in relative motion under load.

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.E01 on Diesel and Gas Turbine Fuels.

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² *Annual Book of ASTM Standards*, Vol 06.04.

³ *Annual Book of ASTM Standards*, Vol 05.01.

⁴ *Annual Book of ASTM Standards*, Vol 10.03.

⁵ *Annual Book of ASTM Standards*, Vol 05.02.

⁶ *Annual Book of ASTM Standards*, Vol 05.03.

⁷ Available from American Iron and Steel Institute, 1000 16th St., NW, Washington, DC 20036.

⁸ Available from American National Standards Institute, 11 West 42nd St., 13th Floor, New York, NY 10036.

⁹ Available from Society of Automotive Engineers, 400 Commonwealth Ave., Warrendale, PA 15096.