



Designation: D 4857 – 02

An American National Standard

Standard Test Method for Determination of the Ability of Lubricants to Minimize Ring Sticking and Piston Deposits in Two-Stroke-Cycle Gasoline Engines Other Than Outboards¹

This standard is issued under the fixed designation D 4857; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This test method² evaluates the performance of lubricants intended for use in two-stroke-cycle spark-ignition gasoline engines that are particularly prone to ring sticking. Piston varnish and spark plug fouling are also evaluated.

1.2 The values stated in SI units are the standard. The values given in parentheses are provided for information only.

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:

- B 152 Specification for Copper Sheet, Strip, Plate, and Rolled Bar³
- D 93 Test Methods for Flash-Point by Pensky-Martens Closed Cup Tester⁴
- D 235 Specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent)⁴
- D 445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids⁴
- D 874 Test Method for Sulfated Ash from Lubricating Oils and Additives⁴
- D 2270 Practice for Calculating Viscosity Index from Kinematic Viscosity at 40 and 100°C⁴
- D 2622 Test Method for Sulfur in Petroleum Products by Wavelength Dispersive X-ray Fluorescence Spectrometry⁴

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

D 4629 Test Method for Trace Nitrogen in Liquid Petroleum Hydrocarbons by Syringe/Inlet Oxidative Combustion and Chemiluminescence Detection⁵

D 4858 Test Method for Determination of the Tendency of Lubricants to Promote Preignition in Two-Stroke-Cycle Gasoline Engines⁵

D 4859 Specification for Lubricants for Two-Stroke-Cycle Spark Ignition Gasoline Engines-TC⁵

D 4863 Test Method for Determination of Lubricity of Two-Stroke-Cycle Gasoline Engine Lubricants⁵

D 4951 Test Method for Determination of Additive Elements in Lubricating Oils by Inductively Coupled Plasma Atomic Emission Spectrometry⁵

E 230 Specification and Temperature-Electromotive Force (EMF) Tables for Standardized Thermocouples⁶

G 40 Terminology Relating to Wear and Erosion⁷

2.2 ANSI Standard:

ANSI MC 96.1 American National Standard for Temperature Measurement Thermocouples⁸

3. Terminology

3.1 Definitions:

3.1.1 *cold sticking*—of piston rings, a condition in which the ring is free in its groove while the engine is running but stuck when the piston is cold, normally indicated by the absence of varnish or other deposits on the outer face of the ring and of signs of blowby on the piston skirt.

3.1.2 *combustion chamber*—in reciprocating internal combustion engines, the volume bounded by the piston crown and any portion of the cylinder walls extending above the piston crown when in the top dead center position, and the inner surface of the cylinder head including any spark plugs and other inserted components.

D 4858

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.B0 on Automotive Lubricants.

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² Until the next revision of this test method, the ASTM Test Monitoring Center will update changes in this test method by means of Information Letters. These can be obtained from the ASTM Test Monitoring Center, 6555 Penn Ave., Pittsburgh, PA 15206-4489. Attention: Administrator. This edition incorporates revisions in all Information Letters through No. 02-1.

³ *Annual Book of ASTM Standards*, Vol 02.01.

⁴ *Annual Book of ASTM Standards*, Vol 05.01.

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

⁶ *Annual Book of ASTM Standards*, Vol 14.03.

⁷ *Annual Book of ASTM Standards*, Vol 03.02.

⁸ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.