



Standard Test Method for Determination of High Temperature Deposits by Thermo- Oxidation Engine Oil Simulation Test¹

This standard is issued under the fixed designation D6335; 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 procedure to determine the amount of deposits formed by automotive engine oils utilizing the thermo-oxidation engine oil simulation test (TEOST²).³ An interlaboratory study (see Section 17) has determined it to be applicable over the range from 10 mg to 65 mg total deposits.

NOTE 1—Operational experience with the test method has shown the test method to be applicable to engine oils having deposits over the range from 2 mg to 180 mg total deposits.

1.2 The values stated in SI units are to be regarded as standard.

1.2.1 Milligrams (mg), grams (g), milliliters (mL), and liters are the units provided, because they are an industry accepted standard.

1.2.2 *Exception*—Pounds per square inch gauge (psig) is provided for information only in 6.2.

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. Terminology

2.1 Definitions of Terms Specific to This Standard:

2.1.1 *ceramic isolator, n*—the fitting that compresses the O-ring into the depositor rod casing and isolates the depositor rod casing from the voltage applied to the depositor rod.

2.1.2 *depositor rod*⁴, *n*—a patented, specially made, numbered, and registered steel rod (used once for each test) on which the deposits are collected. It is resistively heated through a series of twelve temperature cycles during the test to temperatures established and controlled by a thermocouple inserted to a pre-determined depth in the hollow rod.

2.1.3 *depositor rod casing, n*—the sleeve that surrounds the depositor rod and allows the flow of the test oil up and around the outside of the rod at a flow rate such that every volume element of the test oil is exposed to the same heating cycle.

2.1.4 *drain tube, n*—the tube connecting the upper outlet of the depositor rod casing to the reaction chamber.

2.1.5 *end cap, n*—the fitting to tighten the ceramic isolators onto the O-rings at both ends of the depositor rod casing.

2.1.6 *filter deposits, n*—the mass in milligrams of the deposits collected after test on a special multi-layer filter cartridge used once for each test.

2.1.7 *pump, n*—the gear pump that is used to control the flow rate of the test oil through the depositor rod casing.

2.1.8 *pump inlet tube, n*—the tube connecting the reactor chamber to the pump.

2.1.9 *pump outlet tube, n*—the tube connecting the pump to the depositor rod casing.

2.1.10 *reactor chamber, n*—the heated reservoir that contains the bulk (approximately 100 mL) of the 116 mL of test oil sample circulated past the deposit rod during the test. The reactor is equipped with a magnetic stir-bar to continuously mix the chamber contents.

2.1.10.1 *Discussion*—In the reaction chamber, moist air and nitrous oxide are each bubbled at a controlled rate of 3.5 mL/min through a channel opening at the bottom of the

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 D02.09.0G on Oxidation Testing of Engine Oils.

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² TEOST is a trademark of the Tannas Co. (Reg. 2001396), Tannas Company, 4800 James Savage Rd., Midland, MI 48642.

³ The Development of Thermo-Oxidation Engine Oil Simulation Test (TEOST), Society of Automotive Engineers (SAE No. 932837), 400 Commonwealth Dr., Warrendale, PA 15096-0001.

⁴ The sole source of supply of the apparatus known to the committee at this time is Tannas Co., 4800 James Savage Rd., Midland, MI 48642. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.