Designation: D 6557 – 04

An American National Standard

Standard Test Method for Evaluation of Rust Preventive Characteristics of Automotive Engine Oils[1]

This standard is issued under the fixed designation D 6557; 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 a Ball Rust Test (BRT) procedure for evaluating the anti-rust ability of fluid lubricants. The procedure is particularly suitable for the evaluation of automotive engine oils under low-temperature, acidic service conditions.

1.2 Information Letters are published occasionally by the ASTM Test Monitoring Center (TMC)[2] to update this test method. Copies of these letters can be obtained by writing the center.

1.3 The values stated in either SI units or in other units shall be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, use each system independently of the other, without combining values in any way.

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.* See 7.1.1-7.1.3 and 8.2.1.1.

2. Referenced Documents

2.1 *ASTM Standards:* [3]

D 5844 Test Method for Evaluation of Automotive Engine Oils for Inhibition of Rusting (Sequence IID)[4]

E 344 Terminology Relating to Thermometry and Hydrometry

D 6894 Test Method for Evaluation of Aeration Resistance of Engine Oils in Direct-Injected Turbocharged Automotive Diesel Engine

3. Terminology

3.1 *Definitions:*

3.1.1 *calibrate*, *v*—to determine the indication or output of a measuring device or a given engine with respect to a standard. **D 6894**

3.1.2 *corrosion*, *n*—the chemical or electrochemical reaction between a material, usually a metal surface, and its environment that can produce a deterioration of the material and its properties. **D 5844**

3.1.3 *non-reference oil*, *n*—any oil other than a reference oil, such as a research formulation, commercial oil, or candidate oil. **D 5844**

3.1.4 *reference oil*, *n*—an oil of known performance characteristics, used as a basis for comparison. **D 5844**

3.1.4.1 *Discussion*—Reference oils are used to calibrate testing facilities, to compare the performance of other oils, or to evaluate other materials (such as seals) that interact with oils.

3.1.5 *rust*, *n—of ferrous alloys*, a corrosion product consisting primarily of hydrated iron oxides. **D 5844**

3.1.6 *test oil*, *n*—any oil subjected to evaluation in an established procedure.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *average gray value* (AGV), *n*—measurement of brightness units on test specimens, indicating the degree of rust protection.

3.2.2 *specimen*, *n*—a carbon steel ball, 7⁄32 in. (AISI 1040).

4. Summary of Test Method

4.1 Multiple test tubes, each containing test oil and a specimen, are placed in a test tube rack, which is attached to a mechanical shaker. The shaker speed and temperature are controlled.

4.2 Air and an acidic solution are continuously fed into each test tube over an 18 h period to create a corrosive environment.

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[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 the test method by means of information letters. Information letters may be obtained from the ASTM Test Monitoring Center, 6555 Penn Avenue, Pittsburgh, PA 15206-4489. This test method is supplemented by Information Letters and Memoranda issued by the ASTM TMC. This edition incorporates revisions in all Information Letters through No. 03–02.

[3] 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.

[4] Withdrawn.

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