Designation: D7548 – 16a

Standard Test Method for Determination of Accelerated Iron Corrosion in Petroleum Products[1]

This standard is issued under the fixed designation D7548; 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 an accelerated laboratory and field procedure for the determination of corrosion of iron, in the presence of water, on samples such as gasoline and gasoline blended with 10 % ethanol, E10 (Specification D4814); gasoline-blend components (except butane); diesel fuel and biodiesel B5, except Grade No. 4-D (Specification D975); biodiesel B6 to B20 (Specification D7467); diesel-blend component such as light cycle-oil; No.1 fuel oil, No.2 fuel oil (Specification D396); aviation turbine fuel (Specification D1655).

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

1.2.1 *Exception*—Values in parentheses are 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:*[2]

A108 Specification for Steel Bar, Carbon and Alloy, Cold-Finished

D97 Test Method for Pour Point of Petroleum Products

D396 Specification for Fuel Oils

D665 Test Method for Rust-Preventing Characteristics of Inhibited Mineral Oil in the Presence of Water

D975 Specification for Diesel Fuel Oils

D1193 Specification for Reagent Water

D1655 Specification for Aviation Turbine Fuels

D4814 Specification for Automotive Spark-Ignition Engine Fuel

D7467 Specification for Diesel Fuel Oil, Biodiesel Blend (B6 to B20)

G15 Terminology Relating to Corrosion and Corrosion Testing (Withdrawn 2010)[3]

2.2 *Other Standards:*

British Standard BS970–1:070M20 [4]or European Steel C22E Number 1.1151—Carbon and Carbon Manganese Steels including Free Cutting Steels

3. Terminology

3.1 *Definitions:*

3.1.1 *corrosion, n*—chemical or electrochemical reaction between a material, usually a metal, and its environment that produces a deterioration of the material and its properties. **G15**

3.1.2 *rust, n*—corrosion product consisting primarily of hydrated iron oxide.

3.1.2.1 *Discussion*—Rust is a term properly applied only to ferrous alloys. **G15**

3.2 *Acronyms:*

3.2.1 *TP*—temperature probe.

4. Summary of Test Method

4.1 A polished iron corrosion test-rod is immersed in 50 mL of the sample being tested and heated to 37.8 °C (100 °F), at which point 5 mL of reagent water, Type III or better, is added to the sample. Sample temperature is maintained between 37 °C to 39 °C (98 °F to 102 °F), with the target being 37.8 °C (100 °F), for 1 h. At the end of the heating period, test-rod is removed, rinsed, and examined for the degree/category of corrosion against the "ASTM Iron Corrosion Rating Chart–Test Method D7548."

5. Significance and Use

5.1 In general, wherever the possibility exists of water getting mixed with products/material (covered under 1.1) 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 D02.14 on Stability and Cleanliness of Liquid Fuels.

Current edition approved Oct. 1, 2016. Published December 2016. Originally approved in 2009. Last previous edition approved in 2016 as D7548 – 16. DOI: 10.1520/D7548-16A.

[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] The last approved version of this historical standard is referenced on www.astm.org.

[4] *Annual Book of IP Standard Methods for Analysis and Testing of Petroleum and Related Products*, Vol 2. Available from Energy Institute, 61 New Cavendish St., London, W1G 7AR, U.K., http://www.energyinst.org.

***A Summary of Changes section appears at the end of this standard**

Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. United States