



Standard Test Method for Vapor-Phase Rust-Preventing Characteristics of Hydraulic Fluids¹

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^{ε1} NOTE—Updated [Note 2](#) and added mercury caveat editorially in August 2011.

1. Scope

1.1 This test method covers the ability of hydraulic fluids to prevent the rusting of steel in the vapor phase over the hydraulic fluid and water.

1.2 The values stated in SI units are to be regarded as standard. The values given in parentheses are for information only.

1.3 **WARNING**—Mercury has been designated by many regulatory agencies as a hazardous material that can cause central nervous system, kidney and liver damage. Mercury, or its vapor, may be hazardous to health and corrosive to materials. Caution should be taken when handling mercury and mercury containing products. See the applicable product Material Safety Data Sheet (MSDS) for details and EPA's website—<http://www.epa.gov/mercury/faq.htm>—for additional information. Users should be aware that selling mercury and/or mercury containing products into your state or country may be prohibited by law.

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.*

2. Referenced Documents

2.1 ASTM Standards:²

[A108](#) Specification for Steel Bar, Carbon and Alloy, Cold-Finished

[A240/A240M](#) Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure

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.N0.02 on Industrial Applications.

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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.

Vessels and for General Applications

[D91](#) Test Method for Precipitation Number of Lubricating Oils

[D665](#) Test Method for Rust-Preventing Characteristics of Inhibited Mineral Oil in the Presence of Water

[D1193](#) Specification for Reagent Water

[D3603](#) Test Method for Rust-Preventing Characteristics of Steam Turbine Oil in the Presence of Water (Horizontal Disk Method)

[E1](#) Specification for ASTM Liquid-in-Glass Thermometers

2.2 Other Standards:

[IP 60/80](#) Specification for Petroleum Spirit³

[BS 970: 1955–EN3B](#) Specification for wrought steels⁴

3. Summary of Test Method

3.1 This test method is divided into two parts:

3.1.1 *Part A*—Used only for fluids where water is the continuous phase. Examples of such fluids include water-glycol hydraulic fluids and high-water-content hydraulic fluids. Do not use Part A to evaluate invert emulsion hydraulic fluids.

3.1.2 *Part B*—Used for both water-containing fluids and completely water-free fluids such as petroleum based hydraulic fluids, except phosphate esters. In Part B a small beaker of water is present to provide water vapor to cause corrosion in the absence of a vapor-phase inhibitor in the fluid. Part B is the appropriate procedure for evaluating invert emulsion hydraulic fluids.

3.2 In both Part A and Part B, a steel specimen is attached to the underside of the cover of a beaker containing the fluid under test. The apparatus and specimen are identical to those of Test Method [D3603](#). The fluid is brought to a test temperature of 60°C (140°F).

3.3 In Part B, the test specimen is exposed to the vapor from the fluid for 30 min prior to the introduction of water. A beaker of water is then placed in the undercarriage of the cover.

³ Available from Energy Institute, 61 New Cavendish St., London, WIG 7AR, U.K., <http://www.energyinst.org>.

⁴ Available from IHS, 15 Inverness Way East, Englewood, CO 80112, <http://www.global.ihs.com>.