



Standard Test Method for Corrosion Characteristics of Solid Film Lubricants¹

This standard is issued under the fixed designation D 2649; 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 approval. 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.

^{e1} NOTE—Paragraph 8.2.1 was corrected editorially in February 2000.

1. Scope

1.1 This test method² covers the evaluation of the corrosion characteristics of dry solid film lubricants under conditions of high humidity.

1.2 The values stated in SI units are to be regarded as the standard. The inch-pound units given 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:

- B 209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate³
- B 211 Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire³
- B 308/B 308 M Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles³
- D 235 Specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Cleaning Solvent)⁴
- D 1730 Practices for Preparation of Aluminum and Aluminum-Alloy Surfaces for Painting⁵
- D 1748 Test Method for Rust Protection by Metal Preservatives in the Humidity Cabinet⁶

D 4175 Terminology Relating to Petroleum, Petroleum Products, and Lubricants⁷

2.2 U. S. Military Specifications:⁸

MIL-S-7742 Screw Threads, Standard, Optimum Selected Series

MIL-R-3043 Resin-Coating, Permanent (for Internal Engine Parts)

2.3 Government Standard:⁹

P-D-680 Dry Cleaning and Degreasing Solvent

3. Terminology

3.1 Definitions:

3.1.1 *lubricant, n*—any material interposed between two surfaces that reduces the friction or wear between them (see Test Method D 4175).

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *dry solid film lubricant, n*—on an aluminum surface, one consisting of friction-reducing powders bonded in tight matrix to the surface of the metal.

4. Summary of Test Method

4.1 An aluminum panel having solid film deposited on one surface is contacted under load with the surface of an unlubricated panel. The specimen is subjected to $95 \pm 3\%$ relative humidity at 49°C (120°F) for a period of 500 h. After this period, the surface of the unlubricated panel is examined for evidence of corrosion.

5. Significance and Use

5.1 Surfaces are examined for signs of corrosion. Any sign of corrosion is an indication of potential field failure.

¹ This test method is under the jurisdiction of ASTM Committee D-2 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.02 on Industrial Lubricants.

Current edition approved July 10, 1999. Published September 1999. Originally published as D 2649 – 67. Last previous edition D 2649 – 93.

² Reference may be made to Military Specification MIL-L-8937 (ASG), Jan. 22, 1963, and Method 3814 of Federal Test Method Standard No. 791.

³ *Annual Book of ASTM Standards*, Vol 02.02.

⁴ *Annual Book of ASTM Standards*, Vol 06.04.

⁵ *Annual Book of ASTM Standards*, Vols 02.05 and 06.02.

⁶ *Annual Book of ASTM Standards*, Vol 05.01.

⁷ *Annual Book of ASTM Standards*, Vol 05.03.

⁸ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

⁹ Available from Superintendent of Documents, U. S. Government Printing Office, Washington, DC 20402.