



Designation: D2510 – 22

Standard Test Method for Adhesion of Solid Film Lubricants¹

This standard is issued under the fixed designation D2510; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This test method² covers the measurement of the adhesion characteristics of dry solid film lubricants.

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

1.2.1 *Exception*—The values given in parentheses are provided 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*³

B209M Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) (Withdrawn 2021)⁴

D1000 Test Methods for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications

D1193 Specification for Reagent Water

D1730 Practices for Preparation of Aluminum and Aluminum-Alloy Surfaces for Painting

D3330/D3330M Test Method for Peel Adhesion of Pressure-Sensitive Tape

D4175 Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants

F22 Test Method for Hydrophobic Surface Films by the Water-Break Test

2.2 *U.S. Military Specification:*⁵

MIL-L-46010

3. Terminology

3.1 For definitions of terms used in this test method, refer to Terminology **D4175**.

3.2 *Definitions:*

3.2.1 *dry solid film lubricants, n*—dry coatings consisting of lubricating powders in a solid matrix bonded to one or both surfaces to be lubricated.

4. Summary of Test Method

4.1 The dry solid film lubricant is applied to anodized aluminum panels, immersed in water or other fluids for 24 h, and then wiped dry. A strip of masking tape is pressed onto the panel and removed abruptly. Film removal exposing the surface of the metal panel is the criterion for failure.

5. Significance and Use

5.1 Effective solid film lubricant coatings must adhere to surfaces to provide adequate lubrication in applications with restricted access where fluid lubricants cannot easily be replenished. Loss of coating adhesion results in metal to metal contact causing significant wear of contacting surfaces. Adhesion is critical to the performance of the solid film lubricant. Examples of solid film lubricant applications include fasteners, bearings and sliding members in automotive, aircraft, and aerospace hardware.

5.2 This test method is intended to determine the adhesion of solid film lubricant coatings when submitted to contact with water and other fluids. Results of this test provide an indication of the suitability of the lubricant coating in applications where contact with water or other fluids is likely.

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.L0.05 on Solid Lubricants.

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² Refer to U. S. Military Specification MIL-L-46010–March 4, 1988.

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

⁵ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

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