



Designation: D429 – 14 (Reapproved 2023)

Standard Test Methods for Rubber Property—Adhesion to Rigid Substrates¹

This standard is issued under the fixed designation D429; 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 These test methods cover procedures for testing the static adhesional strength of rubber to rigid materials (in most cases metals).

Method A—Rubber Part Assembled Between Two Parallel Metal Plates.

Method B—90° Stripping Test—Rubber Part Assembled to One Metal Plate.

Method C—Measuring Adhesion of Rubber to Metal with a Conical Specimen.

Method D—Adhesion Test—Post-Vulcanization (PV) Bonding of Rubber to Metal.

Method E—90° Stripping Test—Rubber Tank Lining—Assembled to One Metal Plate.

Method F—Rubber Part Assembled Between Two Parallel Convex-Shaped Metal Plates

Method G—Measuring Bond Durability for Rubber-to-Metal Bonded Components with a Double Shear Cylindrical Specimen

Method H—Measuring Bond Durability for Rubber-to-Metal Bonded Components with a Quadruple Shear Specimen

1.2 While the test method may be used with a wide variety of rigid materials, use of materials other than metals is the exception. For this reason, we have used the word “metal” in the text rather than “rigid materials.”

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

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standard-*

ization 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:²

B117 Practice for Operating Salt Spray (Fog) Apparatus

D395 Test Methods for Rubber Property—Compression Set

D412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension

D471 Test Method for Rubber Property—Effect of Liquids

D572 Test Method for Rubber—Deterioration by Heat and Oxygen

D573 Test Method for Rubber—Deterioration in an Air Oven

D1149 Test Methods for Rubber Deterioration—Cracking in an Ozone Controlled Environment

E4 Practices for Force Calibration and Verification of Testing Machines

G153 Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

2.2 ASTM Adjuncts:

Holding Fixture Drawings³

3. Significance and Use

3.1 These test methods are designed primarily for specimens prepared in a laboratory under standardized conditions such as may be used to provide data for development and control of rubber compounds and methods of manufacture. With slight modifications as indicated, Methods A, B, C, D, and E are also used for obtaining comparative adhesion test values of production parts whenever the design permits preparation of suitable test specimens. Methods A, B, C, and D are

¹ These test methods are under the jurisdiction of ASTM Committee D11 on Rubber and Rubber-like Materials and are the direct responsibility of Subcommittee D11.25 on Rubber Adhesive Systems.

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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.

³ Complete detail drawings of the fixture are available from ASTM International Headquarters. Order Adjunct No. [ADJD0429-E-PDF](#). Original adjunct produced in 1959.