Designation: D429 – 14

Standard Test Methods for Rubber Property—Adhesion to Rigid Substrates[1]

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

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

2.2 *ASTM Adjuncts:*

Holding Fixture Drawings[3]

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 applicable in the case of many products in which rubber is used for controlling vibration.

METHOD A—RUBBER PART ASSEMBLED BETWEEN TWO PARALLEL METAL PLATES

4. Adhesion Failure Terminology

4.1 *R* indicates the failure is in the rubber.

[1] These test methods are under the jurisdiction of ASTM Committee D11 on Rubberand 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. Original adjunct produced in 1959.

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