



Designation: ~~D5649-94~~ Designation: D 5649 – 01 (Reapproved 2008)

Standard Test Method for Torque Strength of Adhesives Used on Threaded Fasteners¹

This standard is issued under the fixed designation D 5649; 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.

1. Scope

1.1 This test method is used to make comparative assessments of the securing or locking effect of adhesives used in threaded assemblies.

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1.2 The values stated in inch-pound units are to be regarded as standard. No other units of measurement are included in this standard.

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:*²

D 907 Terminology of Adhesives

D 2651 Guide for Preparation of Metal Surfaces for Adhesive Bonding

E 177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E 691 Practice for Conducting an Interlaboratory Test Program Study to Determine the Precision of a Test Method

3. Terminology

3.1 *Definitions*—For technical terms pertaining to adhesives, see Terminology D 907.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 ~~breakaway torque~~ *breakaway torque, n* —the initial torque required to break the bond measured at the first movement between the nut and the bolt when unscrewing an unseated assembly.

3.2.2 ~~on torque~~ *on torque, n* —the maximum torque required to screw the nut onto a preapplied adhesive-coated bolt.

3.2.3 ~~prevailing torque~~ *prevailing torque, n* —the torque measured after the initial breakage of the bond measured at 180° rotation of the nut.

4. Summary of Test Method

4.1 This test method consists of determining the torque required to unscrew a bonded nut and bolt assembly. Breakaway torque and prevailing torque are determined.

5. Significance and Use

5.1 This test method provides reasonably accurate information with regard to the determination of the securing or locking effect of adhesives used in threaded fasteners. This test method may also be used to determine the degree of cure and the effect of environment on torque strength.

5.2 The accuracy of the test results depends to a large degree on the thread clearance of the test fasteners and the inclusion of air bubbles in the bond line. Data generated by this test method should be safety-factored accordingly if used as quality assurance acceptance or rejection.

¹ This test method is under the jurisdiction of ASTM Committee D-14 on Adhesives and is the direct responsibility of Subcommittee D14.80 on Metal Bonding Adhesives

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¹ This test method is under the jurisdiction of ASTM Committee D14 on Adhesives and is the direct responsibility of Subcommittee D14.60 on Adhesive Material Classification System.

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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* Vol 15.06, volume information, refer to the standard's Document Summary page on the ASTM website.