



Designation: D3165 – 07 (Reapproved 2023)

Standard Test Method for Strength Properties of Adhesives in Shear by Tension Loading of Single-Lap-Joint Laminated Assemblies¹

This standard is issued under the fixed designation D3165; 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 (**Note 1**) is intended for determining the comparative shear strengths of adhesives in large area joints when tested on a standard single-lap-joint specimen and under specified conditions of preparation and testing. Adhesives respond differently in small versus large area joints (**Note 2**).

NOTE 1—While this test method is intended for use in metal-to-metal applications, it may be used for measuring the shear properties of adhesives using plastic adherends, provided consideration is given to the thickness and rigidity of the plastic adherends. Doublers or bonded tabs may be required for plastic adherends to prevent bearing failure in the adherends.

NOTE 2—This variation can be influenced by adhesive density, flow characteristics, cure rate, gel time, carrier composition, entrapped volatiles, volatiles released during cure, etc. and also by cure cycle variables including: temperature, time, pressure, rise rate to temperature, cool-down rate, etc. In addition to the processing variables joint size changes the level of constraint on the adhesive as well as the influence of induced tensile loads at the edge of the joint during mechanical or thermal loading.

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

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

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2. Referenced Documents

2.1 ASTM Standards:²

- A167 Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip (Withdrawn 2014)³
- A366/A366M Specification for Commercial Steel (CS) Sheet, Carbon, (0.15 Maximum Percent) Cold-Rolled (Withdrawn 2000)³
- B36/B36M Specification for Brass Plate, Sheet, Strip, And Rolled Bar
- B152/B152M Specification for Copper Sheet, Strip, Plate, and Rolled Bar
- B209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) B0209_B0209M
- B265 Specification for Titanium and Titanium Alloy Strip, Sheet, and Plate
- D907 Terminology of Adhesives
- D2093 Practice for Preparation of Surfaces of Plastics Prior to Adhesive Bonding
- D2651 Guide for Preparation of Metal Surfaces for Adhesive Bonding
- D3933 Guide for Preparation of Aluminum Surfaces for Structural Adhesives Bonding (Phosphoric Acid Anodizing)
- D4896 Guide for Use of Adhesive-Bonded Single Lap-Joint Specimen Test Results
- E4 Practices for Force Calibration and Verification of Testing Machines

3. Terminology

3.1 **Definitions**—Many terms in this test method are defined in Terminology D907.

4. Significance and Use

4.1 This test method is useful in that the joint configuration closely simulates the actual joint configuration of many bonded

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

