



Designation: D2295 – 96 (Reapproved 2016)

# Standard Test Method for Strength Properties of Adhesives in Shear by Tension Loading at Elevated Temperatures (Metal-to-Metal)<sup>1</sup>

This standard is issued under the fixed designation D2295; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This test method covers the determination of the comparative shear strengths of adhesives for bonding metals when tested on a standard specimen and under specified conditions of preparation and testing at elevated temperatures.

1.2 This test method is applicable to the temperature range from 315 to 850°C (600 to 1500°F).

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 consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

[A167 Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip \(Withdrawn 2014\)](#)<sup>3</sup>

[D638 Test Method for Tensile Properties of Plastics](#)

[D907 Terminology of Adhesives](#)

[D1002 Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading \(Metal-to-Metal\)](#)

2.2 *Military Specifications:*

[MIL-S-25043 Steel Plate, Sheet, and Strip](#)<sup>4</sup>

<sup>1</sup> 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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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> The last approved version of this historical standard is referenced on [www.astm.org](http://www.astm.org).

<sup>4</sup> Available from DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, <http://quicksearch.dla.mil>.

## 3. Terminology

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

## 4. Significance and Use

4.1 Comparative strength of adhesive bonds at elevated temperatures allows for better selection of adhesives that must perform at temperatures above normal. This test method is useful in supplying such information.

## 5. Apparatus

5.1 *Testing Machine*, conforming to the requirements of Test Method D638. Use pin-type grips as shown in Fig. 1 to hold the test specimen.

5.2 *Heating Equipment*, consisting of a radiant heat source, backed by a high-efficiency reflector for the purpose of obtaining the desired heat flux. A suitable lamp arrangement for heating a specimen is shown in Fig. 2.

## 6. Test Specimens

6.1 Cut test specimens from panels shown in Fig. 3(a). These test specimens' form and dimensions are shown in Fig. 3(b). The specimens are similar to the tension lap shear specimen described in Fig. 1 of Test Method D1002, except that pin-type grips are used.

6.2 Base the selection of materials on the test temperature range. The following grades of steel are recommended, although use of other types of heat-resistant steel is permitted:

Metal	Designation
Steel, corrosion-resistant (18-8) plate, sheet, and strip	A167, Type 302
Steel plate, sheet, and strip 17-7PH, TH 1050, corrosion-resistant, precipitation hardened	MIL-S-25043

The nominal thickness for the sheet 1.270 mm (0.050 in.).

## 7. Preparation of Test Specimens

7.1 Cut test specimens as shown in Fig. 3(b) to dimensions from the test panel. Measure the width of the specimen and the length of the overlap to the nearest 0.25 mm (0.01 in.).

7.2 Prepare test specimens by bonding individual strips as shown in Fig. 3(b). Machine unbonded individual strips to size and free from burrs or other irregularities.