Designation: D2293 – 96(Reapproved 2008)

Standard Test Method for Creep Properties of Adhesives in Shear by Compression Loading (Metal-to-Metal)[1]

This standard is issued under the fixed designation D2293; 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 covers the determination of the creep properties of adhesives for bonding metals when tested on a standard specimen and subjected to certain conditions of temperature and compressive stress in a spring-loaded testing apparatus.

1.2 The values stated in SI units are to be regarded as standard. The inch-pound units 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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

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)

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 research and development for comparison of creep properties of adhesives, particularly as those properties are affected by changes in adhesive formulation or expected service conditions, including temperature, moisture level, and duration of loading.

4.2 The relative size and simplicity of design of the spring-loaded apparatus permits easy portability and transfer from one environment to the next without disturbing static loads.

4.3 The relative simplicity of design with inexpensive materials permits replication of creep tests at relatively low costs.

5. Apparatus

5.1 *Compression Creep Test Apparatus,* as shown in Fig. 1 and Fig. 2.

5.2 *Microscope,* calibrated, with Filar microeyepiece and 10× objective lens.

6. Test Specimens

6.1 Test specimens shall conform to the form and dimensions shown in Fig. 3. These specimens are similar to the tension lap shear specimens described in Test Method D1002, except that the length of either side of the shear area shall be 6.35 mm (¼ in.) rather than 88.9-mm (3½-in.) minimum.

6.2 A complete description of these specimens and the method of preparation is given in Sections 6, 7, and 8 of Test Method D1002.

6.3 For creep measurements, polish the edges of the bonded area of each test specimen, and scribe with three fine lines across the bondline.

7. Procedure

7.1 To conduct a creep test, center the specimen within the slot between the washer and bushing of the apparatus as shown in Fig. 1. Compress the spring between the two bushings to the desired load by tightening the nut. The correct load can be applied by deflecting the spring a given measured amount as determined from a calibration curve.

7.2 To measure total deflection, observe the average displacement of fine razor scratches across the centers of both sides of the lap joints with a calibrated microscope having a Filar microeyepiece and a 10× objective lens.

7.3 If the spring load is allowed to continue to compress the specimen, the observed initial deflection will be followed by a continued increasing deflection with time. To provide a complete history of creep behavior, measure these deflections

[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] 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.