



~~Designation: D3658-90 (Reapproved 1995)~~ Designation: D 3658 – 01 (Reapproved 2008)

Standard Test Method for Determining the Torque Strength of Ultraviolet (UV) Light- Cured Glass/Metal Adhesive Joints¹

This standard is issued under the fixed designation D 3658; 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 simplistic comparison of strengths of glass/metal joints when the adhesive is cured by ultraviolet (UV) radiation and standard specimens are used and tested under specified conditions of preparation, radiation, and load.

1.2 This test method involves torque loading UV-bonded hexagonal metal blocks to glass plates.

1.3 This test method may be used to obtain comparative torque strength-to-failure data for other bonded joint systems, radiation cured or not.

1.4

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.5 *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

~~A109 Specification for Steel, Strip, Carbon, Cold-Rolled~~ 109/A 109M Specification for Steel, Strip, Carbon (0.25 Maximum Percent), Cold-Rolled

A 167 Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip

B 36/B 36M Specification for Brass Plate, Sheet, Strip, and Rolled Bar

B 152/B 152M Specification for Copper Sheet, Strip, Plate, and Rolled Bar

B 209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate

B 265 Specification for Titanium and Titanium Alloy Strip, Sheet, and Plate

D 907 Terminology of Adhesives

~~D 1002 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—Definitions—Many of the terms in this test method may be found~~ are defined in Terminology D 907.

4. Significance and Use

4.1 This test method provides reasonably accurate information with regard to the ability of UV curing adhesives to withstand torsional shearing forces. It may be used to determine the effect of environment on torsional shear strength.

5. Apparatus

~~5.1 The apparatus is schematically shown in~~

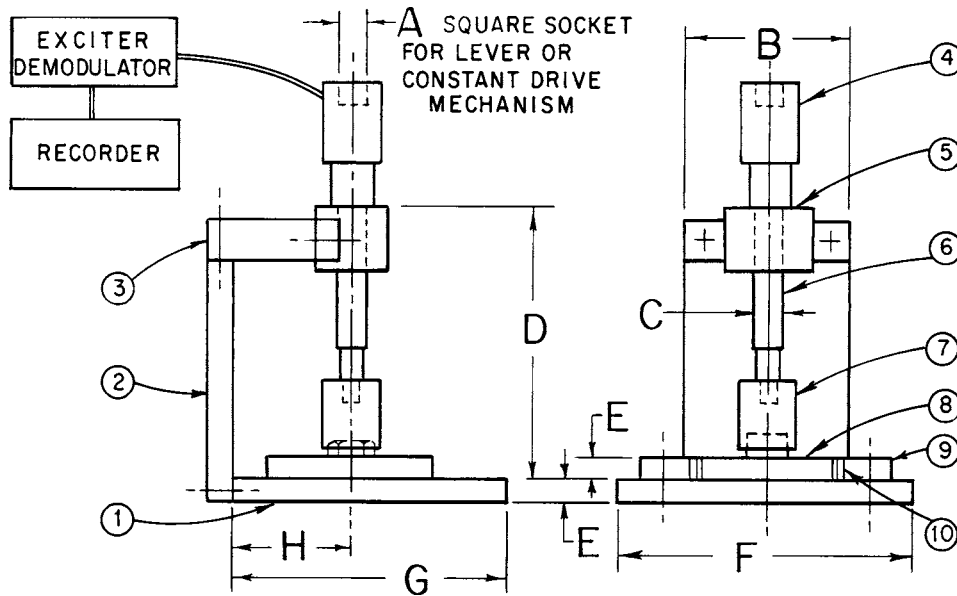
5.1 Test system consisting of apparatus capable of transferring a uniform and continuous torque to the bonded hexagonal block (schematically shown in Fig. 1:-

~~5.2 The apparatus shall be capable of transferring a uniform and continuous torque to the bonded hexagonal block.~~

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. Current edition approved March 30, 1990. Published May 1990. Originally published as D3658-78. Last previous edition D3658-78(1984).

² 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. Current edition approved April 1, 2008. Published April 2008. Originally approved in 1978. Last previous edition approved in 2001 as D 3658 – 01.

³ 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 01.03, volume information, refer to the standard's Document Summary page on the ASTM website.



Details

- 1—Base plate
- 2—Upright
- 3—Mounting bracket
- 4—Lebow socket wrench sensor Model 2133-103
- 5—Pillow block—Boston #PPB10
- 6—Extension—Armstrong #4-105 A
- 7—1-in. (25.4-mm) hexagonal socket—Armstrong #A4-632
- 8—UV specimen (see Fig. 2)
- 9—Adjustable side guides (Fig. 2)
- 10—Neoprene pad (bonded to Detail 9) (Fig. 2)

Dimensions

	in.	mm
A	0.50	13
B	3.75	95
C	0.62	16
D	5.50	140
E	0.50	13
F	6.75	170
G	6.25	160
H	2.62	66

FIG. 1 UV Testing Apparatus

5.3 An accurate and reliable means of recording load to failure, that is, x-y or strip chart recorder, should also be a part of the test system.

5.4 A safety shield or other safety device shall be incorporated as part of the system to prevent injury from possible shattering glass, and a safety shield or other safety device to prevent injury from possible shattering glass.

5.2 An accurate and reliable means of recording load to failure, that is, x-y or strip chart recorder, should also be part of the test system.

6. Test Specimens

6.1 Recommended specimens are as shown in Fig. 2.

6.2 Selection of the test metal for hexagonal blocks is at the discretion of the user; however, the following grades are recommended (see Test Method D 1002):