



Designation: D 3535 – 07

# Standard Test Method for Resistance to Creep Under Static Loading for Structural Wood Laminating Adhesives Used Under Exterior Exposure Conditions<sup>1</sup>

This standard is issued under the fixed designation D 3535; 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 adhesives suitable for the bonding of wood, including treated wood, into structural laminated wood products for general construction, for marine use, or for other uses where a high-strength general construction, creep-resistant, waterproof adhesive bond is required.

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 and health practices and determine the applicability of regulatory limitations prior to use.*

## 2. Referenced Documents

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

**A 125** Specification for Steel Springs, Helical, Heat-Treated  
**D 907** Terminology of Adhesives

**D 2559** Specification for Adhesives for Structural Laminated Wood Products for Use Under Exterior (Wet Use) Exposure Conditions

## 3. Terminology

3.1 *Definitions:*

3.1.1 *glulam, n*—synonym for structural-glued-laminated timber.

3.1.2 *structural-glued-laminated timber, n*—an engineered, stress-rated product of a timber laminating plant comprising assemblies of specially selected and prepared wood laminations securely bonded together with adhesives, with the following characteristics: (1) the grain of all laminations is approximately parallel longitudinally; and (2) the laminations

may be comprised of pieces end-joined to form any length, of pieces placed or glued edge-to-edge to make wider ones or of pieces bent to curved form during gluing. (Synonym *glulam*) ANSI/AITC A190.1 – 2002, American National Standard for Wood Products—Structural Glued Laminated Timber (Edited to conform with ASTM format).

3.1.3 For other terms used in this test method, refer to Terminology **D 907**.

## 4. Summary of Test Method

4.1 Glued laminations are subjected to a constant load under various combinations of temperature and relative humidity. The amount of creep is measured.

## 5. Significance and Use

5.1 This test method rates the performance of the adhesive in laminated wood as measured by resistance to creep under static load.

5.2 This test method will normally be used in conjunction with Specification **D 2559**.

## 6. Apparatus

6.1 *Compression-Type Creep Tester*, as shown in Fig. 1,<sup>3</sup> required for testing the specimens under the static load. This tester consists of:

- 6.1.1 *Base Plate*,
- 6.1.2 *Four Tension Rods*,
- 6.1.3 *Spacer Plate*,
- 6.1.4 *Center Rod*,
- 6.1.5 *Spring*,
- 6.1.6 *Top Plate*, and
- 6.1.7 *Nuts*.

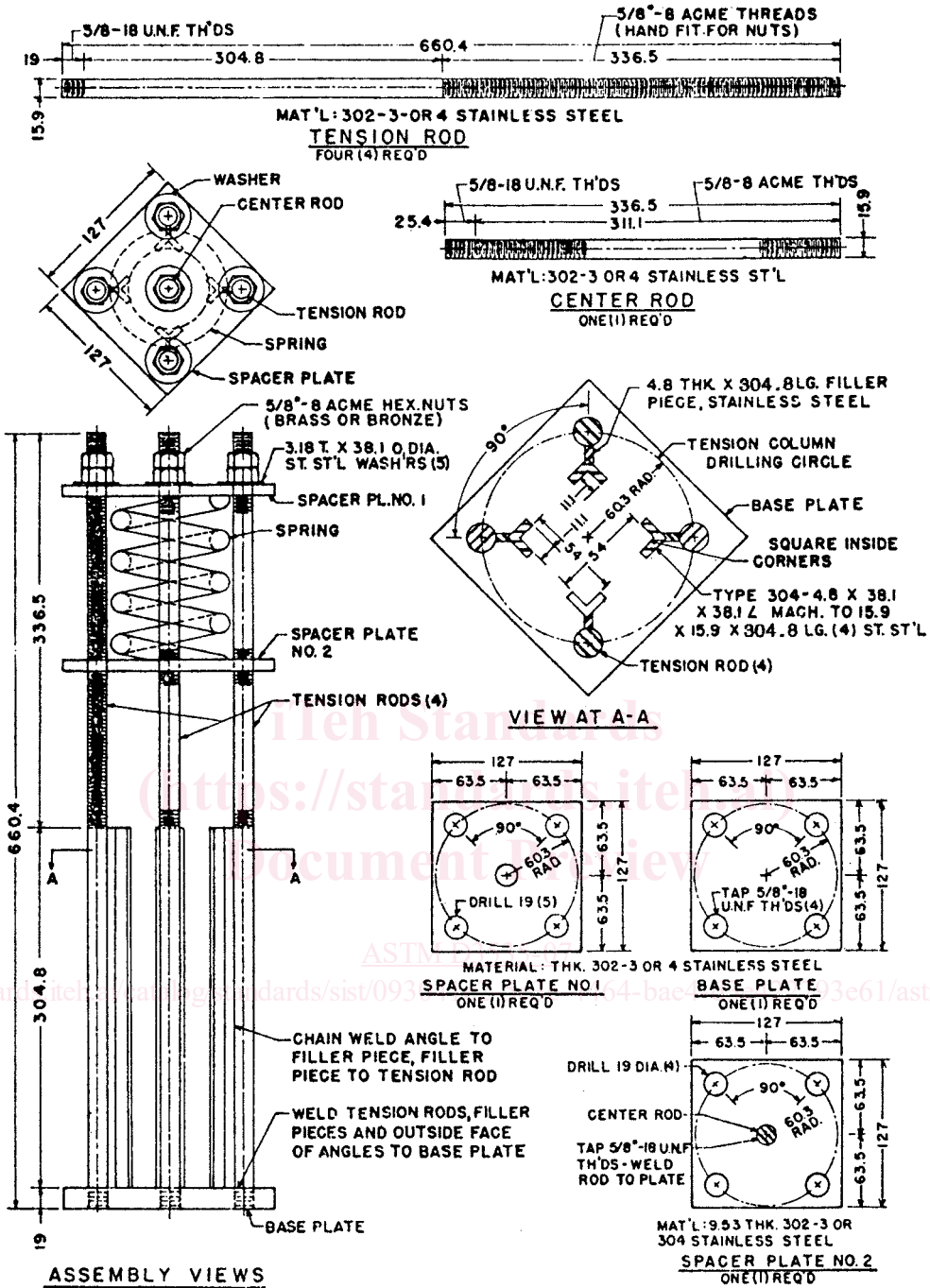
6.2 *Square Metal Spacers*, coated with an effective mold-release agent. Seven are needed for each laminate. Dimensions are 69.8 mm (2¾ in.) long by 15.9 mm (5⁄8 in.) wide by 6.4 mm

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D14 on Adhesives and is the direct responsibility of Subcommittee D14.30 on Wood Adhesives.

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<sup>2</sup> 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.

<sup>3</sup> Springs selected must fit within the space provided [approximately 110-mm (4.3-in.) maximum outside diameter and 300-mm (11.8-in.) maximum overall height] and should be of corrosion-resistant material (for example, stainless steel, cadmium, or zinc-plated steel), should have a spring constant of  $35\,000 \pm 7000$  N/m ( $200 \pm 40$  lbf/in.) and a load when fully compressed (that is at solid height) of about 4500 N (approximately 1000 lbf). For additional information, refer to Specification **A 125** for Steel Springs, Helical, Heat Treated.



Metric Equivalents

mm	in.	mm	in.
3.18	1/8	127	5
4.77	3/16	139.7	5 1/2
9.53	3/8	148	5 9/16
11.1	7/16	165.1	6 1/2
15.9	5/8	267	10 1/2
19.1	3/4	304.8	12
25.4	1	311.1	12 1/4
38.1	1 1/2	336.5	13 1/4
54.0	2 1/8	415	16 3/8
60.3	2 3/8	660.4	26
63.5	2 1/2		

FIG. 1 Compression-Type Creep Tester<sup>3</sup>