



Designation: D 4932 – 89 (Reapproved 2000)^{e1}

Standard Test Method for Fastener Rupture and Tear Resistance of Roofing and Waterproofing Sheets, Roll Roofing, and Shingles¹

This standard is issued under the fixed designation D 4932; 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.

^{e1} NOTE—Editorially switched from English dominant to SI dominant.

1. Scope

1.1 This test method covers the determination of the force needed to pull a fastener through any type of roofing or waterproofing ply sheet, roll roofing, or shingle, or to cause fastener failure under specified laboratory conditions.

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

D 226 Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing²

3. Summary of Test Method

3.1 The force perpendicular to the fastener shank to tear the sheet or to cause fastener failure is measured with the fastener head seated and not seated (tear).

3.2 The force parallel to the fastener shank to rupture the sheet or to cause fastener failure is measured with the head seated (rupture, head pull-through).

4. Significance and Use

4.1 Test values for the resistance of specific ply sheets, roll roofing, or shingles to selected fastener pull-through may assist in the determination of appropriate fastener spacing. The relative behavior of different fasteners and fasteners with and without caps may be evaluated.

4.2 Laboratory data will not permit prediction of field performance, particularly long-term performance, and if all test conditions are not the same, data may not be comparable.

5. Apparatus

5.1 *Testing Machine*— Universal or tensile testing machine with automatic load recording equipment, capable of cross-head movement at a constant rate of 25.4 mm/min (1.00 in./min).

5.2 *Grips*—Self-aligning grips or clamps for holding the free end of the test specimen and the nailer holding jig without slippage during the test.

5.3 *Nailer Holding Jig*—100-mm (4-in.) length of cold-formed carbon steel, rectangular structural tubing with outside nominal dimensions of 102 by 51 mm (4 by 2 in.) and 4.8-mm ($\frac{3}{16}$ -in.) wall thickness, fabricated as shown in Fig. 1.

5.4 *Wood Nailers*, 33 by 89 – 13, + 1 by 102 mm (1.5 by 3.5 – 0.5, + 0.05 by 4 in.) (nominal 2 by 4 in. lumber cut to 4 in. length is appropriate). Thirty nailers are required per sample.

NOTE 1—The wood nailers must hold the fastener securely and remain secure in the nailer holding jig during the test. The 89-mm (3.5-in.) dimension is critical for the nailer to be secure in the jig; the other dimensions are not critical and may be varied so long as the nailer works. If preferred, the operator may use continuous lengths of nailer stock up to 1 m (40 in.) long for multiple specimens as opposed to cutting separate nailers for each specimen.

6. Sampling and Test Specimens

6.1 Cut 15 MD specimens, 175 by 100 mm (7 by 4 in.), in the machine direction (MD) and another 15 XMD specimens in the cross-machine direction (XMD) from a representative portion of the sheet to be tested. If no particular sheet is specified, use Type 1 asphalt-saturated organic felt conforming to the requirements prescribed in Specification D 226.

6.2 Thirty fasteners of the type to be tested are required. If no particular fastener is specified, use galvanized roofing nails with a 38-mm (1½ in.) long 3.6-mm (0.1205-in.) diameter straight shank and a 9.5-mm ($\frac{3}{8}$ -in.) diameter head.

¹ This test method is under the jurisdiction of ASTM Committee D08 on Roofing, Waterproofing, and Bituminous Material and is the direct responsibility of Subcommittee D08.20 on Roofing Membrane Systems.

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² *Annual Book of ASTM Standards*, Vol 04.04.