Designation: C 908 – 95

# Standard Test Method for Yield Strength of Preformed Tape Sealants[1]

This standard is issued under the fixed designation C 908; 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 a laboratory procedure for determining the yield strength of preformed tape sealants.

1.2 The values stated in acceptable metric 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 Document

2.1 *ASTM Standard:*

C 717 Terminology of Building Seals and Sealants[2]

## 3. Terminology

3.1 Refer to Terminology C 717 for Definitions of the following terms used in this test method: adhesive failure; cohesive failure; elongation; modulus; primer; substrate; and tape sealant.

## 4. Significance and Use

4.1 Tape sealants are tacky, deformable solids that are used under compression between two or more surfaces of similar or dissimilar materials in a variety of sealing applications. This procedure is not intended to simulate an actual use condition but will give some indication of the cohesive and adhesive bonding properties of the tape. It also provides an indication of the modulus and tensile strength of the sealant tape composition.

## 5. Apparatus

5.1 *Glass Plates*, two, each 6.35 by 76.2 by 76.2 mm (1/4 by 3 by 3 in.).

NOTE 1—Other substrates such as aluminum, acrylic, ABS, etc., may be substituted for the plates (5.1) and panels (5.2).

5.2 *Steel Panels*, two, cold-rolled, each 0.762 by 76.2 by 76.2 mm (0.03 by 3 by 3 in.) (Note 1).

5.3 *Laboratory Press*, or equivalent.

5.4 *Tension Testing Machine*, or equivalent, with a jaw separation rate of 25 mm (1 in.)/min.

5.5 *Recorder*, for recording the tension load in pascals (or pounds-force).

5.6 *Rule.*

5.7 *Spacers*, 5.1 by 5.1 by 76.2 mm (0.20 by 0.20 by 3 in.).

## 6. Sampling

6.1 Take samples to be tested taken from a fresh roll of tape sealant after first removing and discarding approximately the first 0.61 m (2 ft) of the roll.

6.2 Sealant tape configuration should be 9.53 by 9.53 mm (3/8 by 3/8 in.). If the sample does not approximate these dimensions, the sample should be re-extruded rather than plied up to conform to the specified size.

## 7. Test Specimens

7.1 Prepare two test specimens per sample as follows:

7.1.1 Clean the glass plates with a suitable solvent, such as methyl ethyl ketone.

7.1.2 Clean the steel plates with a suitable solvent, such as methyl ethyl ketone.

NOTE 2—If the steel panels have been painted or prepared with other specified surface treatments, omit this cleaning procedure.

NOTE 3—Primers may be used.

7.1.3 Place two 76.2 by 9.53 by 9.53-mm (3 by 3/8 by 3/8-in.) lengths of tape on one of the steel plates, located as shown in Fig. 1, and remove the release paper. Place a spacer outboard of each tape. Place a glass plate over the tape to complete the test specimen assembly in accordance with Fig. 1.

7.1.4 Compress the assembly at 51 mm (2 in.)/min by means of a laboratory press, or equivalent, until the tape sealant thickness is 5.1 mm (0.20 in.), and maintain this compression mode for 1 min. At the end of 1 min raise the press and remove the assembly, taking care not to disturb it.

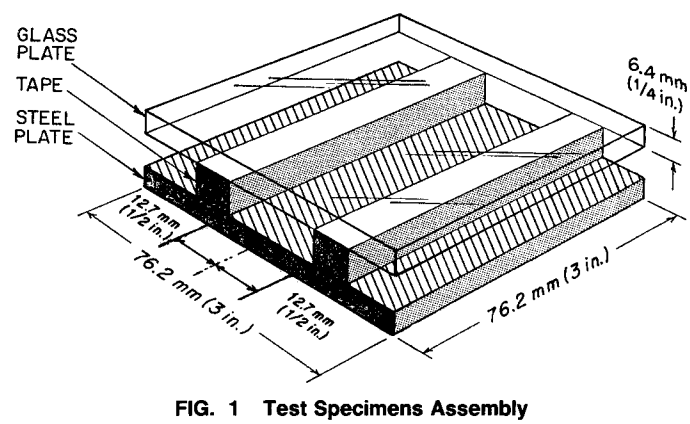


**FIG. 1 Test Specimens Assembly**

[1] This test method is under the jurisdiction of ASTM Committee C-24 on Building Seals and Sealants and is the direct responsibility of Subcommittee C24.50 on Tape Sealants.

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[2] *Annual Book of ASTM Standards*, Vol 04.07.

## 8. Conditioning

8.1 Condition the specimens for 24 h at 23 ± 1°C (73 ± 2°F) and 50 ± 10 % relative humidity.

8.2 Other conditioning parameters may be included as desired.

## 9. Procedure

9.1 Record the average width of the contact area of the tape to the plate glass as measured to the nearest 1.0 mm (1/32 in.).

9.2 Place the test assembly into the jaws of the tension testing machine (Fig. 2).

9.3 Pull the test assembly apart at a jaw separation speed of 25 mm (1 in.)/min (Fig. 3) until the sealant has failed.

9.4 Record the peak tension load in newtons (or pounds-force).

9.5 Record the modulus at the desired elongation levels.

9.6 Record the type of sealant tape failure, either cohesive or adhesive.

9.7 In the event of an adhesive failure, record the substrate at which adhesive failure occurred.

## 10. Calculation

10.1 For each specimen, calculate the tensile yield strength, $Y$, in pascals (or pounds-force per square inch) as follows:

$$Y = \frac{F}{A}$$

where:

$F$ = peak tension load recorded in 9.4 (N or lbf), and

$A$ = area, $m^2$ ($in.^2$) = 76 mm (3 in.) by 2 by width of contact area of each tape as measured in 9.1.

## 11. Report

11.1 Report the following information:

11.1.1 Yield strength in pascals (or pounds per square inch) of each specimen,

11.1.2 Type of failure, cohesive or adhesive (see 9.5 and 9.6),

11.1.3 Type of tension testing machine used (hydraulic or mechanical),

11.1.4 Substrates and primers used,

11.1.5 Conditioning parameters, and

11.1.6 Modulus at the desired elongation levels.

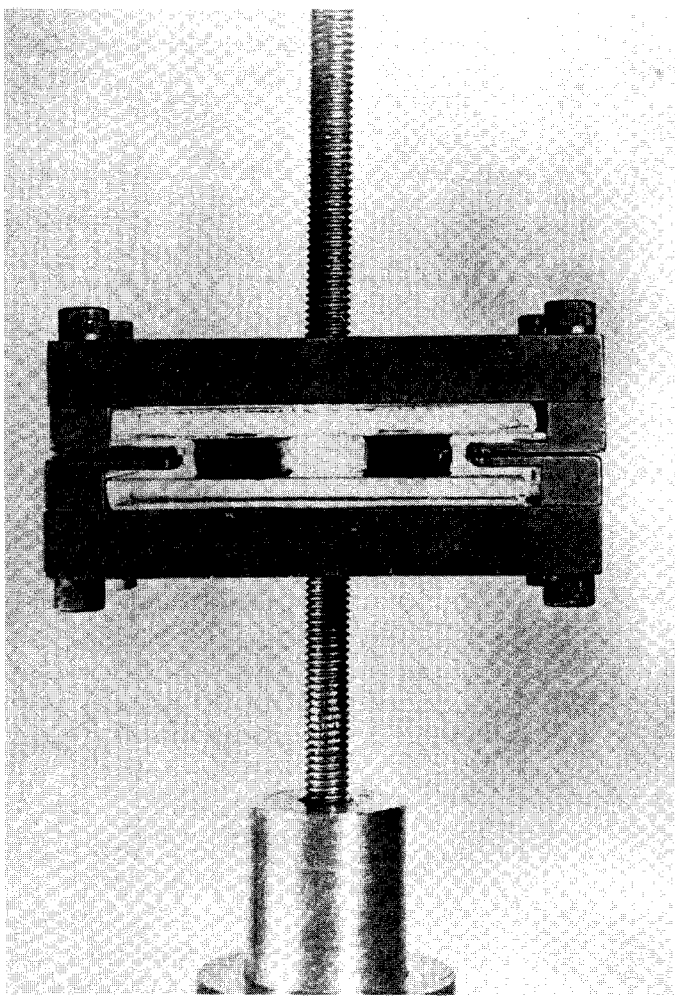

FIG. 2 Test Specimens in Tension Testing Machine

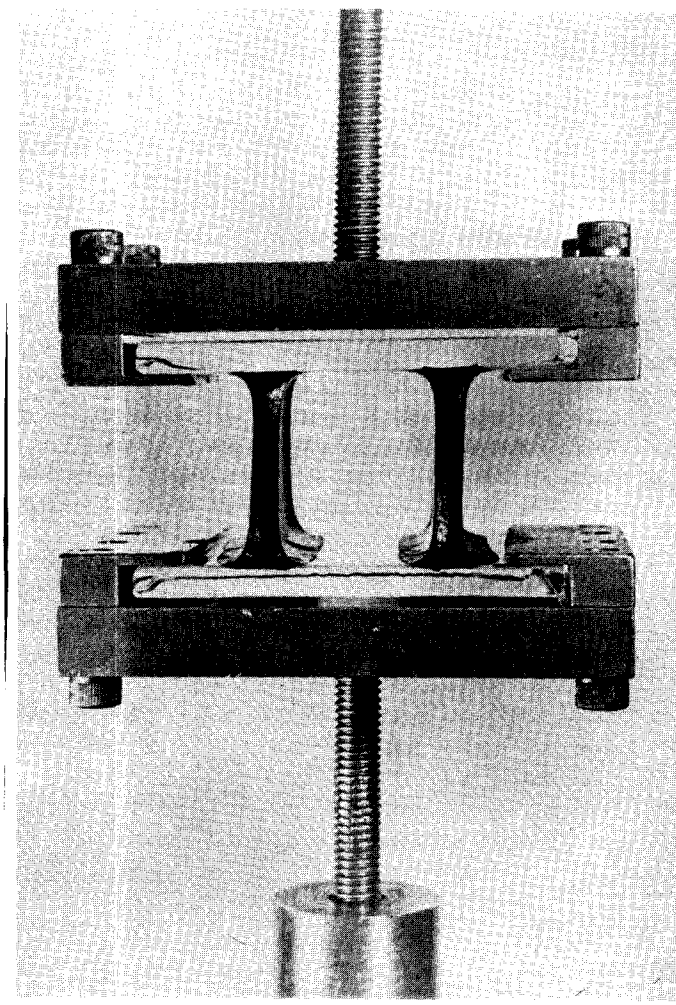

FIG. 3 Pulling Test Assembly Apart

## 12. Precision and Bias[3]

12.1 *Repeatability*—The repeatability (within a given laboratory) interval for 6 materials tested by 4 laboratories is 17.63 kPa (2.557 psi). In future use of this test method, the difference between two test results obtained in the same laboratory on the same material will be expected to exceed 17.63 kPa only about 5 % of the time.

12.2 *Reproducibility*—The reproducibility (between given laboratories) interval for six materials tested by four laboratories is 43.93 kPa (6.372 psi). In future use of this test method, the difference between two test results obtained in a different laboratory on the same material will be expected to exceed 43.93 kPa only 5 % of the time.

[3] Supporting data have been filed as ASTM Headquarters. Request RR: C24-1035.

## 13. Keywords

13.1 modulus; tape sealant; yield strength