



Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions¹

This standard is issued under the fixed designation C297/C297M; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This test method determines the flatwise tensile strength of the core, the core-to-facing bond, or the facing of an assembled sandwich panel. Permissible core material forms include those with continuous bonding surfaces (such as balsa wood and foams) as well as those with discontinuous bonding surfaces (such as honeycomb).

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in nonconformance with the standard.

1.2.1 Within the text the inch-pound units are shown in brackets.

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

[D2711/C2711M Test Method for Density of Sandwich Core Materials](#)

[D792 Test Methods for Density and Specific Gravity \(Relative Density\) of Plastics by Displacement](#)

[D883 Terminology Relating to Plastics](#)

[D2584 Test Method for Ignition Loss of Cured Reinforced Resins](#)

[D2734 Test Methods for Void Content of Reinforced Plastics](#)

[D3039/D3039M Test Method for Tensile Properties of Poly-](#)

[mer Matrix Composite Materials](#)

[D3171 Test Methods for Constituent Content of Composite Materials](#)

[D3878 Terminology for Composite Materials](#)

[D5229/D5229M Test Method for Moisture Absorption Properties and Equilibrium Conditioning of Polymer Matrix Composite Materials](#)

[E4 Practices for Force Verification of Testing Machines](#)

[E6 Terminology Relating to Methods of Mechanical Testing](#)

[E122 Practice for Calculating Sample Size to Estimate, With Specified Precision, the Average for a Characteristic of a Lot or Process](#)

[E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods](#)

[E456 Terminology Relating to Quality and Statistics](#)

3. Terminology

3.1 *Definitions*—Terminology [D3878](#) defines terms relating to high-modulus fibers and their composites, as well as terms relating to sandwich constructions. Terminology [D883](#) defines terms relating to plastics. Terminology [E6](#) defines terms relating to mechanical testing. Terminology [E456](#) and Practice [E177](#) define terms relating to statistics. In the event of a conflict between terms, Terminology [D3878](#) shall have precedence over the other terminologies.

3.2 Symbols:

3.2.1 A —cross-sectional area of a test specimen

3.2.2 CV —coefficient of variation statistic of a sample population for a given property (in percent)

3.2.3 e —edge tolerance between specimen and loading blocks

3.2.4 F_z^{flu} —ultimate flatwise tensile strength

3.2.5 P_{max} —maximum force carried by test specimen before failure

3.2.6 S_{n-1} —standard deviation statistic of a sample population for a given property

3.2.7 x_i —test result for an individual specimen from the sample population for a given property

3.2.8 $\bar{x}$ —mean or average (estimate of mean) of a sample population for a given property

¹ This test method is under the jurisdiction of ASTM Committee [D30](#) on Composite Materials and is the direct responsibility of Subcommittee [D30.09](#) on Sandwich Construction.

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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.