



Standard Test Method for Shear Properties of Composite Materials by the V-Notched Beam Method¹

This standard is issued under the fixed designation D 5379/D 5379M; 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 determines the shear properties of composite materials reinforced by high-modulus fibers. The composite materials are limited to continuous-fiber or discontinuous-fiber-reinforced composites in the following material forms:

1.1.1 Laminates composed only of unidirectional fibrous laminae, with the fiber direction oriented either parallel or perpendicular to the loading axis.

1.1.2 Laminates composed only of woven fabric filamentary laminae with the warp direction oriented either parallel or perpendicular to the loading axis.

1.1.3 Laminates composed only of unidirectional fibrous laminae, containing equal numbers of plies oriented at 0 and 90° in a balanced and symmetric stacking sequence, with the 0° direction oriented either parallel or perpendicular to the loading axis.

1.1.4 Short-fiber-reinforced composites with a majority of the fibers being randomly distributed.

NOTE 1—This shear test concept was originally developed without reference to fiber direction for use on isotropic materials such as metals or ceramics.

1.2 *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.*

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. Within the text the inch-pound units are shown in brackets. 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.

2. Referenced Documents

2.1 ASTM Standards:

D 792 Test Methods for Density and Specific Gravity (Rela-

tive Density) of Plastics by Displacement²

D 883 Terminology Relating to Plastics²

D 2584 Test Method for Ignition Loss of Cured Reinforced Resins³

D 2734 Test Method for Void Content of Reinforced Plastics³

D 3171 Test Method for Fiber Content of Resin-Matrix Composites by Matrix Digestion⁴

D 3878 Terminology for Composite Materials⁴

D 5229/D 5229M Test Method for Moisture Absorption Properties and Equilibrium Conditioning of Polymer Matrix Composite Materials⁴

E 4 Practices for Force Verification of Testing Machines⁵

E 6 Terminology Relating to Methods of Mechanical Testing⁵

E 111 Test Method for Young's Modulus, Tangent Modulus, and Chord Modulus⁵

E 122 Practice for Choice of Sample Size to Estimate a Measure of Quality for a Lot or Process⁶

E 177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods⁶

E 251 Test Methods for Performance Characteristics of Metallic Bonded Resistance Strain Gages⁵

E 456 Terminology Relating to Quality and Statistics⁶

E 1237 Guide for Installing Bonded Resistance Strain Gages⁵

2.2 Other Documents:

ANSI Y14.5M-1982⁷

ANSI/ASME B 46.1-1985⁷

2.3 ASTM Adjuncts:

V-Notched Beam Shear Fixture Machining Drawings⁸

3. Terminology

3.1 Definitions—Terminology D 3878 defines terms relating to high-modulus fibers and their composites. Terminology D 883 defines terms relating to plastics. Terminology E 6

² Annual Book of ASTM Standards, Vol 08.01.

³ Annual Book of ASTM Standards, Vol 08.02.

⁴ Annual Book of ASTM Standards, Vol 15.03.

⁵ Annual Book of ASTM Standards, Vol 03.01.

⁶ Annual Book of ASTM Standards, Vol 14.02.

⁷ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

⁸ Available from ASTM Headquarters, 100 Barr Harbor Dr., PO Box C700, West Conshohocken, PA 19428-2959. Order Adjunct ADJD5379.

¹ This test method is under the jurisdiction of ASTM Committee D-30 on Composite Materials and is the direct responsibility of Subcommittee D30.04 on Lamina and Laminate Test Methods.

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