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Standard Guide for Testing Polymer Matrix Composite Materials¹

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1. Scope

1.1 This guide summarizes the application of ASTM standard test methods (and other supporting standards) to continuous-fiber reinforced polymer matrix composite materials. The most commonly used or most applicable ASTM standards are included, emphasizing use of standards of Committee D30 on Composite Materials.

1.2 This guide does not cover all possible standards that could apply to polymer matrix composites and restricts discussion to the documented scope. Commonly used but non-standard industry extensions of test method scopes, such as application of static test methods to fatigue testing, are not discussed. A more complete summary of general composite testing standards, including non-ASTM test methods, is included in the Composite Materials Handbook (CMH-17).² Additional specific recommendations for testing textile (fabric, braided) composites are contained in Guide D6856.

1.3 This guide does not specify a system of measurement; the systems specified within each of the referenced standards shall apply as appropriate. Note that the referenced standards of ASTM Committee D30 are either SI-only or combined-unit standards with SI units listed first.

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

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:³

- 2.1.1 *Standards of Committee D30 on Composite Materials*
 - C271/C271M** Test Method for Density of Sandwich Core Materials
 - C272/C272M** Test Method for Water Absorption of Core Materials for Sandwich Constructions
 - C273/C273M** Test Method for Shear Properties of Sandwich Core Materials
 - C297/C297M** Test Method for Flatwise Tensile Strength of Sandwich Constructions
 - C363/C363M** Test Method for Node Tensile Strength of Honeycomb Core Materials
 - C364/C364M** Test Method for Edgewise Compressive Strength of Sandwich Constructions
 - C365/C365M** Test Method for Flatwise Compressive Properties of Sandwich Cores
 - C366/C366M** Test Methods for Measurement of Thickness of Sandwich Cores
 - C393/C393M** Test Method for Core Shear Properties of Sandwich Constructions by Beam Flexure
 - C394/C394M** Test Method for Shear Fatigue of Sandwich Core Materials
 - C480/C480M** Test Method for Flexure Creep of Sandwich Constructions
 - C481** Test Method for Laboratory Aging of Sandwich Constructions
 - C613** Test Method for Constituent Content of Composite Prepreg by Soxhlet Extraction
 - D2344/D2344M** Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates
 - D3039/D3039M** Test Method for Tensile Properties of Polymer Matrix Composite Materials
 - D3171** Test Methods for Constituent Content of Composite Materials
 - D3410/D3410M** Test Method for Compressive Properties of Polymer Matrix Composite Materials with Unsupported Gage Section by Shear Loading
 - D3479/D3479M** Test Method for Tension-Tension Fatigue

¹ This guide is under the jurisdiction of ASTM Committee D30 on Composite Materials and is the direct responsibility of Subcommittee D30.01 on Editorial and Resource Standards.

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² Available from SAE International (SAE), 400 Commonwealth Dr., Warrendale, PA 15096, <http://www.sae.org>.

³ 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.