



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 (MIL-HDBK-17).² Additional specific recommendations for testing textile (fabric, braided) composites are contained in Guide D 6856.

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

2. Referenced Documents

2.1 ASTM Standards:³

2.1.1 Standards of Committee D30 on Composite Materials

C 393 Test Method for Flexural Properties of Sandwich Constructions

C 480 Test Method for Flexure Creep of Sandwich Constructions
C 613/C 613M Test Method for Constituent Content of Composite Prepreg by Soxhlet Extraction
D 2344/D 2344M Test Method for Short Beam Strength of Composite Materials and Their Laminates
D 3039/D 3039M Test Method for Tensile Properties of Polymer Matrix Composite Materials
D 3171 Test Method for Constituent Content of Composite Materials
D 3410/D 3410M Test Method for Compressive Properties of Polymer Matrix Composite Materials with Unsupported Gage Section by Shear Loading
D 3479/D 3479M Test Method for Tension-Tension Fatigue of Polymer Matrix Composite Materials
D 3518/D 3518M Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a ± 45 Laminate
D 3529/D 3529M Test Method for Matrix Solids Content and Matrix Content of Composite Prepreg
D 3530/D 3530M Test Method for Volatiles Content of Composite Material Prepreg
D 3531 Test Method for Resin Flow of Carbon Fiber-Epoxy Prepreg
D 3532 Test Method for Gel Time of Carbon Fiber-Epoxy Prepreg
D 3544 Guide for Reporting Test Methods and Results on High Modulus Fibers⁴
D 3800 Test Method for Density of High-Modulus Fibers
D 3878 Terminology of Composite Materials
D 4018 Test Methods for Properties of Continuous Filament Carbon and Graphite Fiber Tows
D 4102 Test Method for Thermal Oxidative Resistance of Carbon Fibers
D 4255/D 4255M Test Method for In-Plane Shear Properties of Polymer Matrix Composite Materials by the Rail Shear Method
D 5229/D 5229M Test Method for Moisture Absorption Properties and Equilibrium Conditioning of Polymer Matrix Composite Materials
D 5379/D 5379M Test Method for Shear Properties of Composite Materials by the V-Notched Beam Method

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 ASTM, and also from the U.S. DoD Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

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.

⁴ Withdrawn.