



Standard Guide for Recording Mechanical Test Data of Fiber-Reinforced Composite Materials in Databases¹

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1. Scope

1.1 This guide provides a common format for mechanical test data for composite materials for two purposes: (1) to establish data reporting requirements for test methods and (2) to provide information for the design of material property databases. This guide should be used in combination with Guide E1309 which provides similar information to identify the composite material tested.

1.2 These guidelines are specific to mechanical tests of high-modulus fiber-reinforced composite materials. Types of tests considered in this guide include tension, compression, shear, flexure, open/filled hole,² bearing, fracture toughness, and fatigue. The ASTM standards for which this guide was developed are listed in 2.1. The guidelines may also be useful for additional tests or materials.

1.3 This guide is the second part of a modular approach for which the first part is Guide E1309. Guide E1309 serves to identify the material, and this guide serves to describe mechanical testing procedures and variables and to record results. The interaction of this guide with Guide E1309 is emphasized by the common numbering of data elements. Data Elements A1 through G13 are included in Guide E1309 and numbering data elements in this guide begins with H1.

1.4 This guide with Guide E1309 may be referenced by the data-reporting section of a test method to provide common data-reporting requirements for the types of tests listed in 1.2.

1.5 From this information and Guide E1309, the database designer should be able to construct the data dictionary preparatory to developing a database schema.

1.6 Data elements in this guide are relevant to test data, data as obtained in the test laboratory and historically recorded in lab notebooks. Property data, data which have been analyzed and reviewed, require a different level of data elements. Data elements for property data are provided in Annex A1.

2. Referenced Documents

2.1 ASTM Standards:³

- D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
- D3039/D3039M Test Method for Tensile Properties of Polymer Matrix Composite Materials
- D3410/D3410M Test Method for Compressive Properties of Polymer Matrix Composite Materials with Unsupported Gage Section by Shear Loading
- D3518/D3518M Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a $\pm 45^\circ$ Laminate
- D3552 Test Method for Tensile Properties of Fiber Reinforced Metal Matrix Composites
- D3878 Terminology for Composite Materials
- D5229/D5229M Test Method for Moisture Absorption Properties and Equilibrium Conditioning of Polymer Matrix Composite Materials
- D5379/D5379M Test Method for Shear Properties of Composite Materials by the V-Notched Beam Method
- D5449/D5449M Test Method for Transverse Compressive Properties of Hoop Wound Polymer Matrix Composite Cylinders
- D5528 Test Method for Mode I Interlaminar Fracture Toughness of Unidirectional Fiber-Reinforced Polymer Matrix Composites
- D5961/D5961M Test Method for Bearing Response of Polymer Matrix Composite Laminates
- D6115 Test Method for Mode I Fatigue Delamination Growth Onset of Unidirectional Fiber-Reinforced Polymer Matrix Composites
- E6 Terminology Relating to Methods of Mechanical Testing
- E111 Test Method for Young's Modulus, Tangent Modulus, and Chord Modulus
- E1309 Guide for Identification of Fiber-Reinforced Polymer-Matrix Composite Materials in Databases
- E1013 Terminology Relating to Computerized Systems

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 Documentation requirements for filled-hole tests were based on open-hole tests with the addition of fastener identification and application information.

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.