



Designation: D5687/D5687M – 20

Standard Guide for Preparation of Flat Composite Panels with Processing Guidelines for Specimen Preparation¹

This standard is issued under the fixed designation D5687/D5687M; 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 guide provides guidelines to facilitate the proper preparation of laminates and test specimens from fiber-reinforced organic matrix composite prepregs. The scope is limited to organic matrices and fiber reinforcement in unidirectional (tape) or orthogonal weave patterns. Other forms may require deviations from these general guidelines. Other processing techniques for test coupon preparation, for example, pultrusion, filament winding and resin-transfer molding, are not addressed.

1.2 Specimen preparation is modeled as an 8-step process that is presented in Fig. 1 and Section 8. Laminate consolidation techniques are assumed to be by press or autoclave. This practice assumes that the materials are properly handled by the test facility to meet the requirements specified by the material supplier(s) or specification, or both. Proper test specimen identification also includes designation of process equipment, process steps, and any irregularities identified during processing.

1.3 *Units*—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 necessarily exact equivalents; therefore, to ensure conformance with the standard, each system shall be used independently of the other, and values from the two systems shall not be combined.

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

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*:²

C297/C297M Test Method for Flatwise Tensile Strength of Sandwich Constructions

D123 Terminology Relating to Textiles

D792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement

D883 Terminology Relating to Plastics

D2734 Test Methods for Void Content of Reinforced Plastics

D3163 Test Method for Determining Strength of Adhesively Bonded Rigid Plastic Lap-Shear Joints in Shear by Tension Loading

D3171 Test Methods for Constituent Content of Composite Materials

D3531 Test Method for Resin Flow of Carbon Fiber-Epoxy Prepreg

D3878 Terminology for Composite Materials

D3990 Terminology Relating to Fabric Defects

D4850 Terminology Relating to Fabrics and Fabric Test Methods

D5229/D5229M Test Method for Moisture Absorption Properties and Equilibrium Conditioning of Polymer Matrix Composite Materials

E1237 Guide for Installing Bonded Resistance Strain Gages

3. Terminology

3.1 *Definitions*—Terminology **D3878** defines terms relating to high-modulus fibers and their composites. Terminology **D883** defines terms relating to plastics. Terminology **D123** defines textile-related terms. Terminology **D4850** defines terms relating to fabric. In the event of a conflict between terms, Terminology **D3878** shall have precedence over the other standards.

3.2 *Description of Terms Used in This Standard*—The terms

¹ This guide is under the jurisdiction of ASTM Committee **D30** on Composite Materials and is the direct responsibility of Subcommittee **D30.04** on Lamina and Laminate Test Methods.

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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.