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.

Designation: D8285/D8285M – 19

Standard Practice for Compressive Properties of Tapered and Stepped Joints of Polymer Matrix Composite Laminates by Sandwich Construction Long Beam Flexure[1]

This standard is issued under the fixed designation D8285/D8285M; 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 practice covers the procedure for determination of the compressive strength of a tapered or stepped bonded joint of polymer matrix composite materials. It is applicable to secondary bonded or co-bonded laminates with either unidirectional plies or woven fabric reinforcements. The materials to be bonded may be different systems. In the bondline, a separate adhesive material may or may not be used (example: adhesives may be used with a prepreg system or may not be used with a wet lay-up repair system). The range of acceptable test laminates and thicknesses are described in 8.2.7. The standard repair types are the same as for the tensile loading in Practice D8131/D8131M. While external patch repairs are not explicitly covered in this practice, these repairs could be tested as a non-standard specimen using this practice.

1.2 This practice supplements Test Method D7249/D7249M for compressive loading of facesheet sandwich constructions by long beam flexure. Several important test specimen parameters (for example, joint length, ply overlaps, step depth, and taper ratio) are not mandated by this practice; however, these parameters are required to be specified and reported to support repeatable results.

1.3 Unidirectional (0° ply orientation) composites as well as multi-directional composite laminates and fabric composites, can be tested.

1.4 *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.

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

1.5 *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.*

1.6 *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]

D792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
D883 Terminology Relating to Plastics
D3171 Test Methods for Constituent Content of Composite Materials
D3878 Terminology for Composite Materials
D5229/D5229M Test Method for Moisture Absorption Properties and Equilibrium Conditioning of Polymer Matrix Composite Materials
D7249/D7249M Test Method for Facesheet Properties of Sandwich Constructions by Long Beam Flexure
D8131/D8131M Practice for Tensile Properties of Tapered and Stepped Joints of Polymer Matrix Composite Laminates
E4 Practices for Force Verification of Testing Machines
E6 Terminology Relating to Methods of Mechanical Testing
E122 Practice for Calculating Sample Size to Estimate, With Specified Precision, the Average for a Characteristic of a Lot or Process
E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods
E456 Terminology Relating to Quality and Statistics

[1] This practice is under the jurisdiction of ASTM Committee D30 on Composite Materials and is the direct responsibility of Subcommittee D30.09 on Sandwich Construction.

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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.

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