



Standard Test Method Interlaminar Shear Strength of 1–D and 2–D Continuous Fiber-Reinforced Advanced Ceramics at Elevated Temperatures¹

This standard is issued under the fixed designation C1425; 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 test method addresses the compression of a double-notched test specimen to determine interlaminar shear strength of continuous fiber-reinforced ceramic composites (CFCCs) at elevated temperatures. Failure of the test specimen occurs by interlaminar shear between two centrally located notches machined halfway through the thickness of the test specimen and spaced a fixed distance apart on opposing faces (see Fig. 1). Test specimen preparation methods and requirements, testing modes (force or displacement control), testing rates (force rate or displacement rate), data collection, and reporting procedures are addressed.

1.2 This test method is used for testing advanced ceramic or glass matrix composites with continuous fiber reinforcement having a laminated structure such as in unidirectional (1-D) or bidirectional (2-D) fiber architecture (lay-ups of unidirectional plies or stacked fabric). This test method does not address composites with nonlaminated structures, such as (3-D) fiber architecture or discontinuous fiber-reinforced, whisker-reinforced, or particulate-reinforced ceramics.

1.3 Values expressed in this test method are in accordance with the International System of Units (SI) and **IEEE/ASTM SI 10**.

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.* Specific precautionary statements are noted in 8.1 and 8.2.

¹ This test method is under the jurisdiction of ASTM Committee C28 on Advanced Ceramics and is the direct responsibility of Subcommittee C28.07 on Ceramic Matrix Composites.

Current edition approved Feb. 15, 2013. Published April 2013. Originally approved in 1999. Last previous edition approved in 2011 as C1425 – 11. DOI: 10.1520/C1425-13.

2. Referenced Documents

2.1 ASTM Standards:²

- C1145 Terminology of Advanced Ceramics
- C1292 Test Method for Shear Strength of Continuous Fiber-Reinforced Advanced Ceramics at Ambient Temperatures
- D695 Test Method for Compressive Properties of Rigid Plastics
- D3846 Test Method for In-Plane Shear Strength of Reinforced Plastics
- D3878 Terminology for Composite Materials
- D6856/D6856M Guide for Testing Fabric-Reinforced “Textile” Composite Materials
- 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
- E220 Test Method for Calibration of Thermocouples By Comparison Techniques
- E230 Specification and Temperature-Electromotive Force (EMF) Tables for Standardized Thermocouples
- E337 Test Method for Measuring Humidity with a Psychrometer (the Measurement of Wet- and Dry-Bulb Temperatures)
- IEEE/ASTM SI 10 American National Standard for Use of the International System of Units (SI): The Modern Metric System

3. Terminology

3.1 **Definitions**—The definitions of terms relating to shear strength testing appearing in Terminology E6 apply to the terms used in this test method. The definitions of terms relating to advanced ceramics appearing in Terminology C1145 apply

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.