



Standard Test Method for Tensile Strength of Monolithic Advanced Ceramics at Elevated Temperatures¹

This standard is issued under the fixed designation C1366; 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 covers the determination of tensile strength under uniaxial loading of monolithic advanced ceramics at elevated temperatures. This test method addresses, but is not restricted to, various suggested test specimen geometries as listed in the appendix. In addition, test specimen fabrication methods, testing modes (force, displacement, or strain control), testing rates (force rate, stress rate, displacement rate, or strain rate), allowable bending, and data collection and reporting procedures are addressed. Tensile strength as used in this test method refers to the tensile strength obtained under uniaxial loading.

1.2 This test method applies primarily to advanced ceramics which macroscopically exhibit isotropic, homogeneous, continuous behavior. While this test method applies primarily to monolithic advanced ceramics, certain whisker, or particle-reinforced composite ceramics as well as certain discontinuous fiber-reinforced composite ceramics may also meet these macroscopic behavior assumptions. Generally, continuous fiber ceramic composites (CFCCs) do not macroscopically exhibit isotropic, homogeneous, continuous behavior and application of this test method to these materials is not recommended.

1.3 The values stated in SI units are to be regarded as the standard and are in accordance with [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. Refer to Section 7 for specific precautions.*

¹ This test method is under the jurisdiction of ASTM Committee C28 on Advanced Ceramics and is the direct responsibility of Subcommittee C28.01 on Mechanical Properties and Performance.

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2. Referenced Documents

2.1 ASTM Standards:²

- [C1145 Terminology of Advanced Ceramics](#)
- [C1161 Test Method for Flexural Strength of Advanced Ceramics at Ambient Temperature](#)
- [C1239 Practice for Reporting Uniaxial Strength Data and Estimating Weibull Distribution Parameters for Advanced Ceramics](#)
- [C1322 Practice for Fractography and Characterization of Fracture Origins in Advanced Ceramics](#)
- [D3379 Test Method for Tensile Strength and Young's Modulus for High-Modulus Single-Filament Materials](#)
- [E4 Practices for Force Verification of Testing Machines](#)
- [E6 Terminology Relating to Methods of Mechanical Testing](#)
- [E21 Test Methods for Elevated Temperature Tension Tests of Metallic Materials](#)
- [E83 Practice for Verification and Classification of Extensometer Systems](#)
- [E220 Test Method for Calibration of Thermocouples By Comparison Techniques](#)
- [E337 Test Method for Measuring Humidity with a Psychrometer \(the Measurement of Wet- and Dry-Bulb Temperatures\)](#)
- [E380 Practice for Use of the International System of Units \(SI\) \(the Modernized Metric System\) \(Withdrawn 1997\)³](#)
- [E1012 Practice for Verification of Testing Frame and Specimen Alignment Under Tensile and Compressive Axial Force Application](#)
- [IEEE/ASTM SI 10 Standard for Use of the International System of Units \(SI\) \(The Modern Metric System\)](#)

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.

³ The last approved version of this historical standard is referenced on www.astm.org.