Scope of Committee C28

The promotion of knowledge, stimulation of research and development of standards (classifications, specifications, nomenclature, test methods, guides, and practices) relating to processing, properties, characterization, and performance of advanced ceramic materials.

This committee works in concert with other technical committees (e.g., D30 "Composite Materials," C14 “Glass and Glass Products," E07 "Non Destructive Testing," E08 "Fatigue and Fracture," E28 "Mechanical Testing," F04 "Medical and Surgical Materials and Devices", and G02 "Wear and Erosion") and other national and international organizations having mutual or related interests.

What Committee C28 Does

Committee C28 develops and maintains standards for monolithic and composite advanced ceramics. An advanced ceramic is a highly-engineered, high-performance predominately non-metallic, inorganic, ceramic material having specific functional attributes. The C28 standards cover methods for testing bulk and constituent (powders, fibres, etc.) properties, thermal and physical properties, strengths and strength distributions, and performance under varying environmental, thermal, and mechanical conditions. The scope of application of the methods ranges from quality control through design data generation.

The Committee's primary objective is the development of technically rigorous standards which are accessible to the general industrial laboratory and consequently are widely accepted and used in the design, production, and utilization of advanced ceramics.

While the committee's roots are in energy-related industries and programs, C28 supports the needs of automotive, aerospace, electronic, medical and other industries requiring advanced ceramics. Some specific applications include nano-ceramics, bio-ceramics, coatings, electronics, sensors/actuators, porous substrates and fuel cells. C28 actively pursues standards development to support these emerging applications.

Committee C28 coordinates its work with other organizations with mutual interests in advanced ceramics. The membership represents an international group of people interested in furthering advanced ceramic technology.

In addition to standards development, C28 sponsors symposia providing a forum for the timely transfer of technical information relevant to the design, analysis, processing, fabrication, and characterization of monolithic and composite advanced ceramics. Special workshops and technical presentations are often held to identify specific industrial needs and support the technical development of new standards.

The Committee meets twice a year in with an on-site meeting and a Web-teleconference. The Committee is self-regulated by committee-approved by-laws under the auspices of ASTM International.
Committee C28  Advanced Ceramic Standards

Visit the C28 website (http://www.astm.org/COMMITTEE/C28.htm) to purchase C28 standards or to join Committee C28.

AGH: C28 standards are found in Vol. 15.01 of the Annual Book of ASTM Standards 01-2023

Graphical illustration of standards under the jurisdiction of Committee C28
(Note: CXXXX refers to a specific standard, STPXXXX refers to Standard Technical Publication)
Subcommittee Details

C28.01 Mechanical Properties & Reliability
C28.01 Interim Chair: Michael Jenkins
Bothell Eng & Science Technologies, Bothell, WA
e-mail: jenkinsm@csufresno.edu

C28.01 Scope:
Develops standards for mechanical properties and reliability (short term and long term) of monolithic advanced ceramics in a number of areas including flexural strength, tensile strength, compressive strength, cyclic fatigue, creep and creep rupture, hardness, and fracture toughness.

C28.01 Standards:
- C1161-18 (90) Test Method for Flexural Strength of Advanced Ceramics at Ambient Temperature
- C1198-20 (91) Test Method for Dynamic Young’s Modulus, Shear Modulus, and Poisson’s Ratio for Advanced Ceramics by Sonic Resonance
- C1211-18 (92) Test Method for Flexural Strength of Advanced Ceramics at Elevated Temperature
- C1239-13 (93) [Reapproved 2018] Practice for Reporting Uniaxial Strength Data and Estimating Weibull Distribution Parameters for Advanced Ceramics
- C1259-21 (94) Test Method for Dynamic Young’s Modulus, Shear Modulus, and Poisson’s Ratio for Advanced Ceramics by Impulse Excitation of Vibration
- C1273-18 (94) Test Method for Tensile Strength of Monolithic Advanced Ceramics at Ambient Temperatures
- C1291-18 (95) Test Method for Elevated Temperature Tensile Creep Strain, Creep Strain Rate, and Creep Time-to-Failure for Advanced Monolithic Ceramics
- C1322-15 (96) [Reapproved 2019] Practice for Fractography and Characterization of Fracture Origins in Advanced Ceramics
- C1326-13 (96) [Reapproved 2018] Test Method for Knop Indentation Hardness of Advanced Ceramics
- C1361-10 (96) [Reapproved 2019] Practice for Constant-Amplitude, Axial, Tension-Tension Cyclic Fatigue of Advanced Ceramics at Ambient Temperatures
- C1366-19 (97) Test Method for Tensile Strength of Monolithic Advanced Ceramics at Elevated Temperatures
- C1368-18 (97) Test Method for Determination of Slow Crack Growth Parameters of Advanced Ceramics by Constant Stress-Rate Flexural Testing at Ambient Temperature
- C1421-18 (99) Test Methods for the Determination of Fracture Toughness of Advanced Ceramics
- C1424-15 (99) Test Method for Compressive Strength of Monolithic Advanced Ceramics at Ambient Temperatures
- C1465-08 (00) [Reapproved 2019] Test Method for Determination of Slow Crack Growth Parameters of Advanced Ceramics by Constant Stress-Rate Flexural Testing at Elevated Temperature
- C1495-16 (01) Test Method for Effect of Surface Grinding on Flexure Strength of Advanced Ceramics
- C1499-19 (02) Test Method for Monotonic Equibiaxial Flexural Strength Testing of Advanced Ceramics at Ambient Temperature
- C1525-18 (02) Test Method for Determination of Thermal Shock Resistance for Advanced Ceramics by Water Quenching
- C1576-05 (05) [Reapproved 2017] Test Method for Determination of Slow Crack Growth Parameters of Advanced Ceramics by Constant Stress Flexural Testing (Stress Rupture) at Elevated Temperature
- C1683-10 (08) [Reapproved 2019] Practice for Size Scaling of Tensile Strengths Using Weibull Statistics for Advanced Ceramics
- C1684-18 (08) Test Method for Flexural Strength of Advanced Ceramics at Ambient Temperature -Cylindrical Rods
- C1834-16 (16) Test Method for Determination of Slow Crack Growth Parameters of Advanced Ceramics by Constant Stress Flexural Testing (Stress Rupture) at Elevated Temperatures

*XX indicates year of current version, (XX) indicates year of original approval and publication if different than —XX

C28.02 Test Methods for the Determination of Fracture Toughness of Advanced Ceramics
C28.03 Physical Properties & NDE
C28.03 Chair: Tony Thornton
Micromeritics, Norcross, GA
e-mail: tony.thornton@micromeritics.com

C28.03 Scope:
Develops standards for physical, chemical, micro-structural, and non-destructive characterization of powder and bulk advanced ceramics.

C28.03 Standards:
- C1070-01 (01) [Reapproved 2020] Test Method for Determining Particle Size Distribution of Alumina or Quartz by Laser Light Scattering
- C1274-12 (94) [Reapproved 2020] Test Method for Advanced Ceramic Specific Surface Area by Physical Adsorption
- C1282-15 (95) Withdrawn in 2014 Test Method for Determining the Particle Size Distribution of Advanced Ceramics by Centrifugal Photosedimentation
- C1331-12 (96) Jurisdiction changed to E07 Nondestructive Testing in 2015 Test Method for Measuring Ultrasonic Velocity in Advanced Ceramics with the Broadband Pulse-Echo Cross-Correlation Method
- C1332-13 (96) Jurisdiction changed to E07 Nondestructive Testing in 2015 Test Method for Measurement of Ultrasonic Attenuation Coefficients of Advanced Ceramics by the Pulse-Echo Contact Technique
- C1336-14 (96) Withdrawn in 2018 Practice for Fabricating Non-Oxide Ceramic Reference Specimens Containing Seeded Inclusions
- C1470-20 (00) Guide for Testing the Thermal Properties of Advanced Ceramics
- C1678-21 (10) [Reapproved 2015] Practice for Fractographic Analysis of Fracture Mirror Sizes in Ceramics and Glasses
- C1730-17 (17) [Reapproved 2022] Test Method for Particle Size Distribution of Advanced Ceramics by X-Ray Monitoring of Gravity Sedimentation

C28.04 Applications
C28.04 Chair: Randy Stafford
Retired-Consultant, Columbus, IN
e-mail: rjsrunning3500@yahoo.com

C28.04 Scope:
Develops standards (including guides, specifications, practices, test methods) for various engineering applications of advanced ceramics, such as nanoceramics, coatings, electrodes, porous ceramics, fuel cells, armor, sensors/actuators, thermal systems.

C28.04 Standards:
- C1323-22 (96) Test Method for Ultimate Strength of Advanced Ceramics with Diameterly Compressed C-Ring Specimens at Ambient Temperature
- C1624-22 (05) Test Method for Adhesion Strength and Mechanical Failure Modes of Ceramic Coatings by Quantitative Single Point Scratch Testing
- C1674-16 (11) Test Method for Flexural Strength of Advanced Ceramics with Engineered Porosity (Honeycomb Cellular Channels) at Ambient Temperatures


C28.05 Environmental Effects
C28.05 Chair: R. J. St. John
International Institute for Advanced Studies, Cambridge, MA
e-mail: rjstjohn@classiccam.org

C28.05 Scope:
Develops standards for environmental effects on advanced ceramics.

C28.05 Standards:
- C1325-16 (06) Test Method for Determination of the Nominal Joint Strength of End-Plug Joints in Advanced Ceramic Tubes at Ambient and Elevated Temperatures
- C1687-16 (11) Test Method for Flexural Strength of Advanced Ceramics with Engineered Porosity (Honeycomb Cellular Channels) at Ambient Temperatures

C1862-17 (17) Test Method for the Nominal Joint Strength of End-Plug Joints in Advanced Ceramic Tubes at Ambient and Elevated Temperatures
C28.07 Ceramic Matrix Composites
C28.07 Chair: Andrew Wereszczak
Oak Ridge National Laboratory, Oak Ridge, TN
Material Properties and Mechanics Group
e-mail: wereszczakaa@ornl.gov

C28.07 Scope:
Develops standards for determination of the thermo-mechanical properties and performance of ceramic matrix composites including tension, compression, shear, flexure, cyclic fatigue, creep/creep rupture, ceramic fibers, interfacial properties, thermo-mechanical fatigue, environmental effects, and structural/component testing.

C28.07 Standards:
C1275-18 (94) Test Method for Monotonic Tensile Behavior of Continuous Fiber-Reinforced Advanced Ceramics with Solid Rectangular Cross-Section at Ambient Temperatures
C1282-22 (95) Test Method for Shear Strength of Continuous Fiber-Reinforced Advanced Ceramics at Ambient Temperatures
C1337-17 (96) Test Method for Creep and Creep Rupture of Continuous Fiber-Reinforced Ceramic Composites under Tensile Loading at Elevated Temperature
C1341-13 (96) [Reapproved 2018] Test Method for Flexural Properties of Continuous Fiber-Reinforced Advanced Ceramic Composites
C1358-18 (96) Test Method for Monotonic Compressive Strength Testing of Continuous Fiber-Reinforced Advanced Ceramics with Solid Rectangular Cross-Section Specimens at Ambient Temperatures
C1359-18* (96) Test Method for Monotonic Tensile Strength Testing of Continuous Fiber-Reinforced Advanced Ceramics with Solid Rectangular Cross-Section Specimens at Elevated Temperatures
C1360-17 (96) Practice for Constant-Amplitude, Axial, Tension-Tension Cyclic Fatigue of Continuous Fiber-Reinforced Advanced Ceramics at Ambient Temperatures
C1425-19 (99) Test Method for Interlaminar Shear Strength of 1-D and 2-D CFCCs at Elevated Temperatures
C1468-19* (00) Test Method for Transthickness Tensile Strength of Continuous Fiber-Reinforced Advanced Ceramics at Ambient Temperatures
C1469-22 (00) Test Method for Shear Strength of Joints of Advanced Ceramics at Ambient Temperature
C1557-20 (03) Test Method for Tensile Strength and Young's Modulus of Fibers
C1773-21 (13) Test Method for Monotonic Axial Tensile Behavior of Continuous Fiber-Reinforced Advanced Ceramic Tubular Test Specimens at Ambient Temperature
C1819-21 (15) Test Method for Hoop Tensile Strength of Continuous Fiber-Reinforced Advanced Ceramic Composite Tubular Test Specimens at Ambient Temperature Using Elastomeric Inserts
C1835-16 (16) Classification for Fiber Reinforced Silicon Carbide-Silicon Carbide (SiC-SiC) Composite Structures
C1836-16 (16) Classification for Fiber Reinforced Carbon-Carbon Composite Structures
C1863-18 (18) Test Method for Hoop Tensile Strength of Continuous Fiber-Reinforced Advanced Ceramic Composite Tubular Test Specimens at Ambient Temperature Using Direct Pressurization
C1869-18 (18) Test Method for Open-Hole Tensile Strength of Fiber-Reinforced Advanced Ceramic Composites
C1899-21 (21) Test Method Test Method for Flexural Strength of Continuous Fiber-Reinforced Advanced Ceramic Tubular Test Specimens at Elevated Temperature

C28.90 Executive Subcommittee
C28.90 Chair: Michael Jenkins
Bothell Eng & Science Technologies, Bothell, WA
e-mail: jenkinsm@csufresno.edu

C28.90 Scope:
Manages administrative matters of main committee C28 through its membership comprised of the committee and subcommittee officers of C28.

C28.91 Nomenclature and Editorial
C28.91 Chair: Jonathan Salem
NASA-Glenn Research Center, Cleveland, OH
e-mail: Jonathan.A.Salem@grc.nasa.gov

C28.91 Scope:
Compiles nomenclature and terminology used in the various standards of C28.

C28.91 Standards:
C1145-19 (91) Terminology on Advanced Ceramics
C1286-94 Withdrawn in 2002 Classification for Advanced Ceramics

C28.92 Education and Outreach
C28.92 Chair: Jonathan Salem
NASA-Glenn Research Center, Cleveland, OH
e-mail: Jonathan.A.Salem@grc.nasa.gov

C28.92 Scope:
Develops and supports efforts for education and outreach for the C28 committee.

C28.92 Documents:
Advanced Ceramic Sentinel

C28.93 Awards
C28.93 Chair: Jonathan Salem
NASA-Glenn Research Center, Cleveland, OH
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C28.93 Scope:
Accepts/acts on nominations for various awards

C28.95 Long Range Planning
C28.95 Chair: Stephen Gonczy
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C28.95 Scope:
Proposes, facilitates and promotes long range planning activities consistent with the mission, goals and objectives of the Committee and its subcommittees.

Documents:
Committee C28 Strategic Plan

Symposia Publications
STP 1201 Life Prediction Methodologies and Data for Ceramic Materials
STP 1309 Thermal and Mechanical Test Methods and Behavior of Continuous-Fiber Ceramic Composites
STP 1392 Mechanical, Thermal and Environmental Testing and Performance of Ceramic Composites and Components
STP 1409 Fracture Resistance Testing of Monolithic and Composite Brittle Materials

Future C28 Meetings
2023 – Sunday, 21 January
In conjunction w/ ACerS 47th ICACC, Daytona Beach, FL
2023 – Wednesday, 19 or 26 July
WebX/Teleconference; Contact Staff Manager for details
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