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," 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.

Graphical illustration of standards under the jurisdiction of Committee C28
(Note: CXXXX refers to a specific standard, STPXXXX refers to Standard Technical Publication)
C28.01 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:
C1161-13 (90) Test Method for Flexural Strength of Advanced Ceramics at Ambient Temperature
C1198-13 (91) Test Method for Dynamic Young’s Modulus, Shear Modulus, and Poisson’s Ratio for Advanced Ceramics by Sonic Resonance
C1211-13 (92) Test Method for Flexural Strength of Advanced Ceramics at Elevated Temperature
C1239-13(93) Practice for Reporting Uniaxial Strength Data and Estimating Weibull Distribution Parameters for Advanced Ceramics
C1259-15 (94) Test Method for Dynamic Young’s Modulus, Shear Modulus, and Poisson’s Ratio for Advanced Ceramics by Impulse Excitation of Vibration
C1273-15 (94) Test Method for Tensile Strength of Monolithic Advanced Ceramics at Ambient Temperatures
C1282-16 (95) Test Method for Elevated Temperature Tensile Creep Stress, Creep Strain Rate, and Creep Time-to-Failure for Advanced Monolithic Ceramics
C1322-15 (96) Practice for Fractography and Characterization of Fracture Origins in Advanced Ceramics
C1326-13 (96) Test Method for Knoop Indentation Hardness of Advanced Ceramics
C1361-15 (96) Practice for Constant-Amplitude, Axial, Tension-Tension Cyclic Fatigue of Advanced Ceramics at Ambient Temperatures
C1366-13 (97) Test Method for Tensile Strength of Monolithic Advanced Ceramics at Elevated Temperatures
C1369-10 (97) Test Method for Determination of Slow Crack Growth Parameters of Advanced Ceramics by Constant Stress-Rate Flexural Testing at Ambient Temperature
C1421-16 (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
C1465-13 (00) 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
C1499-13 (02) Test Method for Monotonic Equibiaxial Flexural Strength Testing of Advanced Ceramics at Ambient Temperature
C1525-12 (02) Test Method for Determination of Thermal Shock Resistance for Advanced Ceramics by Water Quenching
C1576-13 (09) Test Method for Determination of Slow Crack Growth Parameters of Advanced Ceramics by Constant Stress Flexural Testing (Stress Rupture) at Ambient Temperature
C1683-15 (15) Practice for Size Scaling of Tensile Strengths Using Weibull Statistics for Advanced Ceramics
C1684-13 (13) Test Method for Flexural Strength of Advanced Ceramics at Ambient Temperature -Cylindrical Rods

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

C28.03 Chair: Matthias Thommes
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C28.03 Scope:
Develops standards for physical, chemical, microstructural, and non-destructive characterization of powder and bulk advanced ceramics.

C28.03 Standards:
C1070-14 (01) Test Method for Determining Particle Size Distribution of Alumina or Quartz by Laser Light Scattering
C1175-10 (91) Guide to Test Methods for Nondestructive Testing of Advanced Ceramics
C1212-15 (92) Practice for Fabricating Ceramic Reference Specimens Containing Seeded Voids
C1274-12 (94) Test Method for Advanced Ceramic Specific Surface Area by Physical Adsorption
C1282-12 (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 Practice 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) Practice for Fabricating Non-Oxide Ceramic Reference Specimens Containing Seeded Inclusions
C1470-13 (00) Guide for Testing the Thermal Properties of Advanced Ceramics
C1494-13 (01) Test Method for Determination of Mass Fraction of Carbon, Nitrogen, and Oxygen in Silicon Nitride Powder
C1678-15 (10) Standard Practice for Fractographic Analysis of Fracture Mirror Sizes in Ceramics and Glasses
C1730-17 (17) Standard Test Method for Particle Size Distribution of Advanced Ceramics by X-Ray Monitoring of Gravity Sedimentation

C28.04 Applications
C28.04 Chair: Randy Stafford
Cummins Inc., Columbus, IN
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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, and thermal systems.

C28.04 Standards:
C1323-16 (96) Test Method for Ultimate Strength of Advanced Ceramics with Diametrically Compressed C-Ring Specimens at Ambient Temperature
C1624-15 (05) Test Method for Adhesion Strength and Mechanical Failure Modes of Ceramic Coatings by Quantitative Single Point Scratch Testing
C1674-11 (11) Test Method for Flexural Strength of Advanced Ceramics with Engineered Porosity (Honeycomb Cellular Channels) at Ambient Temperatures
C28.07 Chair: Andrew Wereszczak
Oak Ridge National Laboratory, Oak Ridge, TN
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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:
C1275-15 (94) Test Method for Monotonic Tensile Behavior of
Continuous Fiber-Reinforced Advanced Ceramics with Solid
Rectangular Cross-Section at Ambient Temperatures
C1292-16 (95) Test Method for Shear Strength of Continuous
Fiber-Reinforced Advanced Ceramics at Ambient Temperatures
C1337-15 (96) Test Method for Creep and Creep Rupture of
Continuous Fiber-Reinforced Ceramic Composites under Tensile
Loading at Elevated Temperature
C1341-13 (96) Test Method for Flexural Properties of
Continuous Fiber-Reinforced Advanced Ceramic Composites
C1358-13 (96) Test Method for Monotonic Compressive
Strength Testing of Continuous Fiber-Reinforced Advanced
Ceramics with Solid Rectangular Cross-Section Specimens at
Ambient Temperatures
C1359-13 (96) Test Method for Monotonic Tensile Strength
Testing of Continuous Fiber-Reinforced Advanced Ceramics with
Solid Rectangular Cross-Section Specimens at Elevated
Temperatures
C1360-15 (96) Practice for Constant-Amplitude, Axial,
Tension-Tension Cyclic Fatigue of Continuous Fiber-Reinforced
Advanced Ceramics at Ambient Temperatures
C1425-13 (99) Test Method for Interlaminar Shear Strength of
1-D and 2-D CFCCs at Elevated Temperatures
C1468-13 (00) Test Method for Transtickness Tensile Strength
of Continuous Fiber-Reinforced Advanced Ceramics at Ambient
Temperatures
C1469-15 (00) Test Method for Shear Strength of Joints of
Advanced Ceramics at Ambient Temperature
C1557-14 (03) Test Method for Tensile Strength and Young's
Modulus Fibers
C1773-13 (13) Test Method for Monotonic Axial Tensile
Behavior of Continuous Fiber-Reinforced Advanced Ceramic
Tubular Test Specimens at Ambient Temperature
C1783-15 (15) Guide for Development of Specifications for
Fiber Reinforced Carbon-Carbon Composite Structures for Nuclear
Applications
C1793-15 (15) Guide for Development of Specifications for
Fiber Reinforced Silicon Carbide-Silicon Carbide Composite
Structures for Nuclear Applications
C1819-15 (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

C28.90 Chair: Tony Thornton
Micromeritics, Norcross, GA
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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:
C1145-13 (91) Terminology on Advanced Ceramics
C1286-94 Withdrawn in 2002 Classification for Adv Ceramics

C28.92 Education and Outreach
C28.92 Chair: Jonathan Salem
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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
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C28.93 Scope:
Accepts/acts on nominations for various awards

C28.95 Long Range Planning
C28.95 Chair: Michael Jenkins
Bothell Eng & Science Technologies, Bothell, WA
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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 Fracture Resistance Testing and Performance of Ceramic
Composites and Components
STP 1409 Fracture Resistance Testing of Monolithic
and Composite Brittle Materials

Future C28 Meetings
2019 – Saturday/Sunday, 26/27 January
in conjunction w/ ACeS 43rd ICACC, Daytona Beach, FL
2019 – Wednesday, 17 or 24 July
webX/Webconference; Contact Staff Manager for details
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