Introduction

Mechanical and physical properties of ceramic bodies can be difficult to measure correctly unless the proper techniques are used. The Advanced Ceramics Committee of ASTM, C-28, has developed dozens of consensus test standards and practices to measure various properties of a ceramic monolith, composite, or coating. The standards give the “what, how, how not, and why” for measurement of many mechanical, physical, thermal, and performance properties. Using these standards will provide accurate, reliable, and complete data for rigorous comparisons with other test results from your test lab, or another. The C-28 Committee has involved academicians, producers, and users of ceramics to write and continually update more than 45 standards since the committee’s inception in 1986. Included in this poster is a pictogram of the C-28 standards and information on how to obtain individual copies with full details or the complete collection of standards in one volume.

For further information

The C28 Committee and Standards for Ceramics ASTM C28 Committee Page –
http://www.astm.org/COMMIT/COMMITTEE/C28.htm
List of C28 Subcommittees and Links to Standards–
http://www.astm.org/COMMIT/C28.htm
ASTM C28 Advanced Ceramic Standards by Subject–
http://www.astm.org/COMMIT/C28_StdBySubject.doc
Chart showing ASTM C28 Advanced Ceramic Standards–
ASTM Standards for Advanced Ceramics, Whitesewares, Glass, and Ceramic Tile–

Acknowledgments

We thank the more than 90 industry, government, and academic committee members from many countries (~25% non-USA) who have volunteered many hours to develop these standards via work in six technical and four administrative subcommittees.

C28 Advanced Ceramic Standards

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

Monolithics

- C 1143 Flexural strength
- C 1211 Flexural strength (High Temp)
- C 1366 Slow Crack Growth (Dynamic Fatigue)
- C 1465 Slow Crack Growth (High Temp)
- C 1576 Slow Crack Growth (Stress Rupture)
- C 1644 Flexural strength (Room)

Composites, Coatings, Porous Ceramics

- C 1275 CCFC Tensile strength
- C 1276 Tensile strength (High Temp)
- C 1333 Creep, Creep-Rupture
- C 1360 Cyclic fatigue
- C 1586 CCFC Tensile strength
- C 1464 CCFC Tensile strength
- C 1343 CCFC Shear strength
- C 1643 CCFC Shear strength (High Temp)
- C 1206 Shear strength

Powders

- C 1274 Powder Coating, BFT
- C 1282 Particle size, Centrifugal Sed.
- C 1318 Elastic Modulus – Continuous
- C 1259 Elastic modulus – Tubular
- C 1495 Grindability
- C 1225 C-ring strength

NDE and Design

- C 1375 NDE Guide
- C 1331 Ultrasonic velocity
- C 1678 Fracture Mirror
- C 1673 Coatings – Scratch Adhesion
- C 1494 C, N, O in silicon nitride

Terms, Workshops, Education

- ASTM/C28 standards are found in Vol. 15.02.

Standardization: Tangible Benefits

Comparisons Among Authors

- Standardized Armor Ceramics as Spacecraft Windows*

- Standard sized circular disks could be used to determine Poisson’s ratio and Young’s modulus via C1259 and biaxial strength via C1499 as well as the slow crack growth parameters, n and A, via C1368. This allowed efficient understanding of the behavior of the material.

Standardization: Tangible Benefits

F 1973: Standard Specification for High Purity Dense Yttria Tetragonal Zirconium Oxide Polycrystal (Y-TZP) for Surgical Implant Applications

The average flexural strength shall be 800 MPa or greater by 4 point bending in accordance with ASTM C 1161.

The minimum elastic modulus shall be 200 GPa in accordance with C 1198 or C 1259.

If Weibull modulus is tested, it shall be tested in accordance with C 1239.

Composites, Coatings, Porous Ceramics

- CFCC Tensile strength
- CFCC Shear strength

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