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Composite; New Ceramics Surface Reinforcing Treatment using a Combination of Crack-Healing and Electron Beam Irradiation; Effect of Si<sub>3</sub>N<sub>4</sub> on the instability of Li<sub>2</sub>O-Containing Celsian in the BAS/Si<sub>3</sub>N<sub>4</sub> Composites; FATIGUE, WEAR, AND CREEP; Rolling Contact Fatigue Properties and Fracture Resistance for Silicon Nitride Ceramics with Various Microstructures; Fretting Fatigue of Engineering Ceramics Investigation into Cyclic Frequency Effects on Fatigue Behavior of an Oxide/Oxide CompositeFriction and Wear Behavior of AIBC Composites; Creep of Silicon Nitride Observed In Situ with Neutron Diffraction; Hydrothermal Oxidation of Silicon Carbide and Its Bearing on Wet Wear Mechanisms; RELIABILITY, NDE, AND FRACTOGRAPHY; Probabilistic Design Optimization and Reliability Assessment of High Temperature Thermoelectric Devices; Development of a New Computational Method for Solving Inhomogeneous and Ultra Large Scale Model Optical Methods for Nondestructive Evaluation of Subsurface Flaws in Silicon Nitride CeramicsFractographic Analysis of Miniature Theta Specimens; Author Index

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#### Sommario/riassunto

This volume provides a one-stop resource, compiling current research on the behavior and reliability of ceramic macro and micro scale systems. It is a collection of papers from The American Ceramic Society's 32nd International Conference on Advanced Ceramics and Composites, January 27-February 1, 2008. Topics include Design and Testing Challenges for Ceramic Joints; Structural Design, Testing and Life Prediction of Monolithic and Composite Components; Mechanical Behavior, Design, and Reliability of Small Scale Systems; Environmental Effects on Mechanical Properties; and more. This is a valuable

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