



## Fatigue Behavior of a SiC/SiC Composite at 1000°C in Air and Steam

By Michael W. Knauf

Biblioscholar Okt 2012, 2012. Taschenbuch. Book Condition: Neu. 246x189x10 mm. This item is printed on demand - Print on Demand Neuware - Tension-tension fatigue behavior of a prototype Silicon Carbide/Silicon Carbide (SiC/SiC) ceramic matrix composite (CMC) material was investigated at 1000°C in laboratory air and in steam environments. The material consists of a SiC matrix reinforced with CG NICALON(TM) fibers woven in an eight harness satin weave (8HSW) and coated with a BN/SiC dual-layer interphase. The composite was manufactured by a Polymer Infiltration and Pyrolysis (PIP) process. A seal coat of SiC and elemental boron was applied to the test specimens after machining. The tensile stress-strain behavior was investigated and the tensile properties were measured at 1000°C. Tension-tension fatigue behavior was studied for fatigue stresses ranging from 60 to 100 MPa. The fatigue limit (based on a run-out condition of  $2 \times 10^5$  cycles) was 80 MPa, which is 59% of the Ultimate Tensile Strength (UTS). The material retained 82% of its tensile strength. The presence of steam significantly degraded the fatigue performance at 1000°C. In steam the fatigue limit dropped below 60 MPa (44% UTS). Microstructural analysis revealed severe oxidation occurring in the specimens tested in steam, which resulted...



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