

LASER-CVD SILICON CARBIDE FIBERS AS NON WOVEN PREFORMS IN FIBER-REINFORCED SiC-SiC COMPOSITES

Mark C. Schaefer, Free Form Fibers, USA

mschaefer@fffibers.com

Kirk L. Williams, Free Form Fibers, USA

Joseph Pegna, Free Form Fibers, USA

Jeff Vervlied, Free Form Fibers, USA

Key Words: ceramic matrix composite (CMC); silicon carbide fiber; laser-driven chemical vapor deposition (LCVD); fiber-reinforced composites; non woven preforms.

Silicon Carbide (SiC) fibers, produced at Free Form Fibers by laser-driven CVD (LCVD,) have shown enhanced high-temperature properties compared to other commercial SiC fibers. Resistance to oxidation and degradation at elevated temperatures was demonstrated, due to the high-purity, high-quality nature of LCVD-based materials.

With increased production capacity, FFF evaluated fiber performance in SiC-reinforced composite structures. CMC test coupons were fabricated and tested, using FFF SiC fibers in a non woven preform in a SiC-SiC composite material. Flexural strength, creep, tensile, and inter-laminar shear of the composites were assessed, at room temperature and at elevated temperatures (2700 F).



Figure 1 – Several FFF SiC fiber preforms of various GSM loading.