SiGA™ COMPOSITE CAPABILITIES

General Atomics fabricates SiGA™ silicon carbide composites in custom geometries with tailored performance to meet customer requirements.

- Engineered designs in planar, tubular, and custom geometries
- Complex structures with high-purity joining methods
- Irradiation-resistant and oxidation-resistant formulations
- Extensive in-house characterization techniques
- Retains strength to beyond 1600°C
SiGA™ COMPOSITE CAPABILITIES

VERSATILE AND CUSTOMIZABLE FABRICATION

• Chemical Vapor Infiltration and Hot-Press fabrication processes
• Reduced cost due to near net-shape processing
• Tough and impermeable multi-layered structures
• Tube diameters from 5 mm to >50 mm; tube lengths up to 1 m
• Hot-pressed structures with thickness >25 mm
• Blind and thru-hole features without machining
• In-house fiber preforming for custom geometries

SiGA™ JOINING

• Joining of SiC to SiC, and SiC to dissimilar materials
• Provides hermetic sealing with strength retention at high temperature and neutron fluence
• Joining parts in a variety of configurations
• Mechanical connections allow for detachment

ADVANCED COMPOSITE CHARACTERIZATION TECHNIQUES

• Measured mechanical strengths up to 500 MPa at elevated temperatures
• Unirradiated thermal conductivity up to 30 W/m-K
• Advanced analysis techniques include digital image correlation and acoustic emission
• Non-Destructive X-Ray Computed Tomography (XCT) to measure dimensional tolerances, microstructure, and nominal/actual comparisons at up to 3 μm resolution