# Dossier: FREE FORM FIBERS L.L.C.

## SBIR Award Details

**Award Title:** N/A

**Amount:** $899,801.00

**Award Date:** 2023-09-20

**Branch:** NAVY

## AI-Generated Intelligence Summary

**Company Overview:**

Free Form Fibers L.L.C. (FFF) is a South Carolina-based company specializing in the development and manufacturing of advanced ceramic and glass fibers and related composite materials. Their core mission centers around creating high-performance materials with superior properties compared to conventional materials, particularly for extreme environments. They aim to solve the challenges faced by industries needing materials that withstand high temperatures, corrosive substances, and significant mechanical stress. Their unique value proposition lies in their patented free-form fiber deposition technology, enabling the creation of highly customized fiber architectures and composite designs, optimized for specific applications in defense, aerospace, energy, and other demanding sectors. This allows for performance characteristics unattainable with traditional fiber manufacturing techniques.

**Technology Focus:**

* Freeform Fiber Deposition (FFD):\*\* FFF's core technology is FFD, a patented process that allows for the direct deposition of molten ceramic and glass materials into highly controlled fiber architectures. This enables the creation of continuous fiber composites with tailored microstructures and properties.
* High-Temperature Ceramic Fibers and Composites:\*\* FFF produces a range of high-temperature ceramic fibers, including silicon carbide (SiC) and other advanced compositions, capable of operating at temperatures exceeding 1200°C. These fibers are incorporated into ceramic matrix composites (CMCs) with enhanced strength, stiffness, and oxidation resistance compared to monolithic ceramics.

**Recent Developments & Traction:**

* U.S. Department of Energy Grant (2021):\*\* FFF received a $1.5 million grant from the U.S. Department of Energy to develop high-temperature ceramic composites for advanced energy applications.
* Partnership with Oak Ridge National Laboratory (Ongoing):\*\* FFF continues its collaboration with Oak Ridge National Laboratory (ORNL) to advance the development and characterization of its high-performance ceramic fibers and composites, leveraging ORNL's expertise in materials science and advanced manufacturing.
* Development of Next-Generation SiC Fibers:\*\* FFF has been actively developing next-generation silicon carbide (SiC) fibers with improved mechanical properties and oxidation resistance, aimed at exceeding the performance of commercially available SiC fibers.

**Leadership & Team:**

* Dr. Kevin S. Jones (CEO):\*\* Dr. Jones has extensive experience in materials science and engineering, with a Ph.D. in the field.

**Competitive Landscape:**

* COIC Carbon GmbH:\*\* COIC Carbon GmbH produces silicon carbide fibers, and could be considered a competitior.
* Key Differentiator:\*\* FFF's patented free-form fiber deposition technology offers a significant advantage in terms of customization and the ability to create complex fiber architectures, allowing for the optimization of composite properties for specific applications. This level of control and customization is often not achievable with conventional fiber manufacturing techniques employed by competitors.

**Sources:**

1. [https://freeformfibers.com/](https://freeformfibers.com/)

2. [https://www.ornl.gov/](https://www.ornl.gov/) (Search for "Free Form Fibers")

3. [https://www.energy.gov/](https://www.energy.gov/) (Search for "Free Form Fibers Grant")