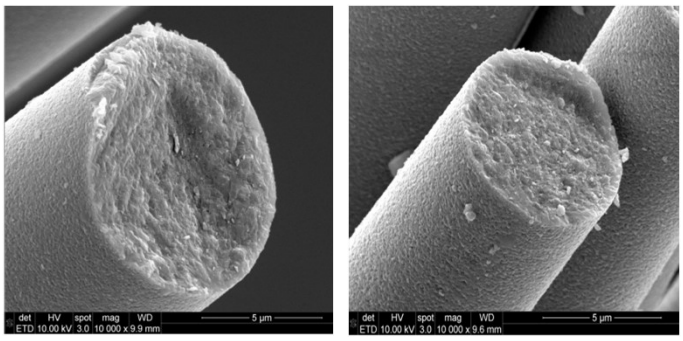
Sylramic™

Sylramic™ SiC Fiber is a 10 µm diameter crystalline silicon carbide (SiC) fiber with the highest temperature capability of any available SiC fiber. **Sylramic™** is manufactured by COI Ceramics, Inc. (COIC) and is commercially available as tow. Additional product information is provided on the other side of this brochure. COIC technical staff may be contacted at (801)251-8111 for delivery needs and pricing.



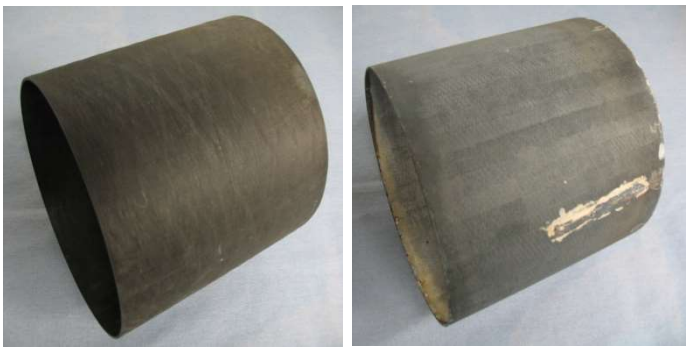
Sylramic™ SiC Fiber is manufactured at the COIC San Diego facility, which also specializes in the manufacture of both oxide and nonoxide CMC products. The COIC Salt Lake City facility serves as the worldwide distribution and customer service center for ceramic fiber reinforcement products. The use of two facilities ensures the confidentiality of the customer-specific fiber and CMC business areas.

BACKGROUND

COI Ceramics, Inc. (COIC) is the leading supplier of high temperature **Sylramic™** and **Nicalon™** SiC fibers. COIC has also been manufacturing and supplying ceramic matrix composites (CMCs) that incorporate these fibers since 1999.

USES

Sylramic™ SiC Fiber is typically used as a reinforcement in various materials including ceramic, plastic, and metal matrix composites. These products are used in severe environments such as aircraft and land-based turbine engines, hypersonic vehicles, thermal protection systems, and components in chemical manufacturing equipment. The use of **Sylramic™ SiC Fiber** provides increased strength, toughness, chemical resistance, and high temperature creep resistance of various products.



Sylramic™ SiC Fiber reinforcement in 8" diameter CMC combustor liners. Filament-wound liner (left, before test) and involute-layup liner (after rig testing).

PRODUCT FORM

Sylramic™ SiC fiber is provided as a textile grade continuous tow (yarn) made up of 800 filaments with a denier of 1600. Each filament is 10 µm in diameter, and the tow is coated with polyvinyl alcohol (PVA) sizing for improved handling capability.

***COI Ceramics, Inc.**, offers a variety of advanced ceramic products that are engineered to meet the demanding requirements of high-temperature applications. See the COI Ceramics website for a complete review of the materials solutions available for your applications. www.coiceramics.com*

Sylramic™ SiC Fiber Tow

Continuous tow is supplied on 3 inch diameter cardboard spools. Lengths up to 800 meters (145 grams) are available. Tow length may vary depending upon availability and customer requirements.

Sylramic™ SiC Fiber, Woven

As a textile grade yarn, **Sylramic™ SiC Fiber** can be readily incorporated into a variety of weaves, woven tapes, braids, etc. A network of U.S. contractors exists to respond to your exact needs. Contact COI Ceramics to discuss specifics and receive further information.

SPECIAL PROPERTIES

Sylramic™ SiC Fiber has excellent room temperature strength and stiffness. The fiber has excellent creep resistance, maintaining strength and stiffness for extended times at extremely high temperatures (> 1400°C / 2252°F). These fiber properties are due to its chemical composition, crystalline structure, small crystal size, and very low oxygen content. This also allows it to have excellent wear and corrosion resistance capability. See Table 1 for typical properties and composition information.

Sylramic™ SiC Fiber overcomes the disadvantages of other materials. Oxide fibers and superalloys may lose their mechanical properties above 800°C (1472°F). SiCO fibers lose mechanical properties above 1000°C (1832°F), while amorphous SiC fibers lose mechanical properties above 1200°C (2192°F). Larger diameter (100 µm), crystalline SiC fibers are not easily woven.

SAFE HANDLING INFORMATION

Product safety information required for safe use is available as a Material Safety Data Sheet (MSDS). The MSDS is available from COIC, and should be consulted before handling the fiber.

LIMITED WARRANTY

COI Ceramics believes that the information contained herein is an accurate description of the typical properties and uses of this product, but it is the users responsibility to test the material to determine its performance and safety in specific applications. The sole warranty is that the product meets the current material certification. COIC specifically disclaims any other express or implied warranty.

TABLE 1: Typical SYLRAMIC™ SiC Fiber Characteristics & Composition

Characteristic	Units	Typical
Diameter	micron	10
Denier	g/9000 m	1600
Filaments	ea	800
Density	g/cm^3	>2.95
Oxygen	wt%	<0.5
Tensile Strength (RT)	ksi	>400
Tensile Modulus (RT)	Msi	>45
Composition	**Crystal Size (microns)**	**%**
SiC	0.1 - 0.5	96
TiB_2	0.5	3
B_4C	0.1	1
Oxygen	--	0.3

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