

Q-Fiber® Amorphous High-Purity Silica Fiber

Bulk Material for Manufacture of Insulating Components

Description

Q-Fiber® is an amorphous, exceptionally pure fibrous silica material used as a lightweight, non-crystalline component in high temperature thermal insulations.

Q-Fiber® is formed from high-silica-content sand which is melted, fiberized, acid-washed to remove impurities, rinsed, dried, and heat-treated for structural integrity.

Applications

Q-Fiber® forms the primary component for a diversity of insulating materials used in aerospace applications in which service temperatures range from -170°F (-112°C) to 2300°F (1260°C).

Q-Fiber® is an efficient, economical alternative for many conventional insulating materials used in nuclear power, automotive, catalytic conversion, and chemical applications. Because of its exceptionally pure fibrous construction, Q-Fiber® also provides a potential source for filtration material.

Advantages

Q-Fiber® provides an excellent combination of physical properties including purity, resilience, light weight, as well as resistance to crystal formation, thermal shock, and heat flow. Extremely high in SiO₂ content (99.7% after processing), chemically stable Q-Fiber® will not devitrify in response to elevated temperatures and rapid thermal cycling.

Q-Fiber® Amorphous High-Purity Silica Fiber imparts high thermal efficiency with low weight, a critical factor in aerospace insulation design. Q-Fiber® also resists thermal shock damage from drastic temperature fluctuations. These flexible and resilient fibers enable Q-Fiber® to be readily formed into a variety of standard and unique shapes including sheets, felts, blocks, tiles, and cast forms.



Applications

- Aerospace
- Nuclear Power
- Automotive/Catalytic Converters
- Chemical Industries

Properties

- Non-Crystal Forming
- Chemically Stable
- Heat Flow Resistant
- High Thermal Efficiency
- Low Weight
- Resistant to Thermal Shock
- Easily formed into unique shapes and cast forms
- High Purity

Specifications

Temperature Limit	Upper Limit: 2300°F (1260°C)
	Continuous Service: 1800°F (982°C)

Type:

Bulk Fiber

Shrinkage*

Temperature °F	°C	Direction of Shrinkage (%)		
		Length	Width	Thickness
1000	538	0.7	0.8	0.9
1200	649	1.4	1.5	1.0
1400	760	1.8	2.2	1.8
1600	871	2.0	2.2	2.0
1800	982	2.6	4.0	9.0
2000	1093	6.2	17.0	40.0

* When felted to 6.0 pcf (96 kg/m³) density

Thermal Conductivity (k) Per ASTM C 518

Density pcf	kg/m ³	75°F (24°C) Mean Temperature		500°F (260°C) Mean Temperature		1000°F (538°C) Mean Temperature	
		Btu•in/(hr•ft ² •°F)	W/m°C	Btu•in/(hr•ft ² •°F)	W/m°C	Btu•in/(hr•ft ² •°F)	W/m°C
6.0	96	0.23	0.033	0.41	0.058	0.72	0.104

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Chemical Composition

Silica—SiO ₂	99.680% Minimum
R ₂ O ₃	.130% Maximum
Titanium Oxide—TiO ₂	.013% Maximum
Iron Oxide—Fe ₂ O ₃	.044% Maximum
Sodium Oxide—Na ₂ O	.020% Maximum
Potassium Oxide—K ₂ O	.005% Maximum
Calcium Oxide—CaO	.032% Maximum
Magnesium Oxide—MgO	.011% Maximum
Boron—B*	.010% Maximum

* The low boron content, normally less than .005%, makes Q-Fiber® particularly useful for thermal control in nuclear applications.

Surface Area

BET surface area measurements indicate 2.38 sq. meters/gm for fiber with an average diameter of 1.5 microns.



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Technical Information

(800) 458-7198

The physical and chemical properties of Q-Fiber® Amorphous High-Purity Silica Fiber listed herein represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Numerical flame spread and smoke developed ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions. Check with the Regional Sales Office nearest you to assure current information. **All Johns Manville products are sold subject to Johns Manville's standard Terms and Conditions including Limited Warranty and Limitation of Remedy. For a copy of the Johns Manville standard Terms and Conditions, Limited Warranty and Limitation of Remedy, and information on other Johns Manville thermal insulations and systems, call (800) 654-3103.**

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