

FUSED SILICA
HOT PRESS PLATENS
CASTABLE CERAMICS
FIRED SHAPES
AEROSPACE TOOLING

Foundry Service & Supplies, Inc.

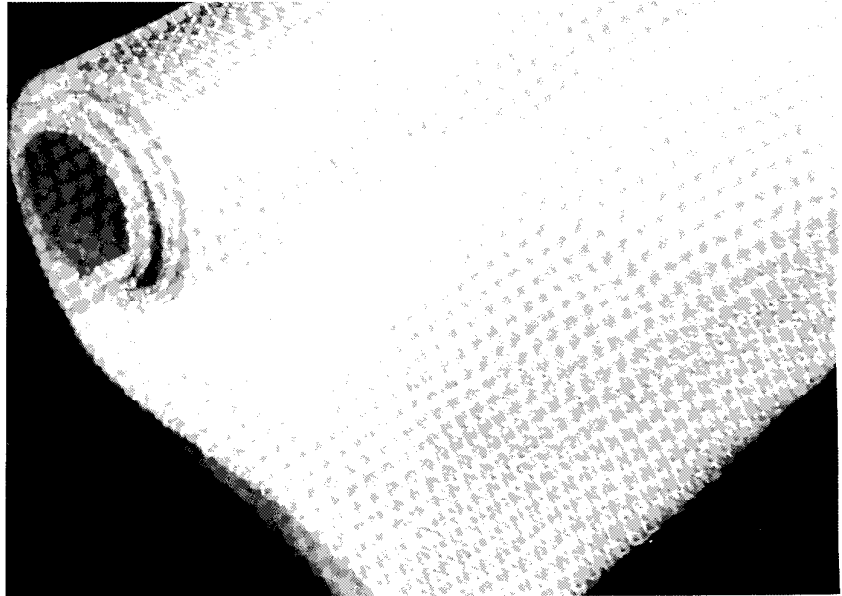
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HI-TEMP INSULATIONS
CALCIUM SILICATE BOARDS
MILLBOARD AND BLANKET
PAPERS AND CEMENTS
CUTTING AND FABRICATING

Nextel™ 312 Woven Fabrics

Nextel™ 312 fabrics are woven from strong continuous Nextel 312 Alumina-Boria-Silica fibers without the aid of organic, glass or metal inserts.

Nextel 312 fabrics retain strength and flexibility with little shrinkage at continuous temperatures of up to 2200°F (1204°C).



Typical Applications:

- Furnace curtains
- Furnace zone dividers
- Furnace linings
- Duct linings
- Expansion joints
- Flexible seals
- Sewn refractory parts and shapes
- Flexible aircraft thermal barriers
- Composite fire barriers for aircraft
- Tadpole gaskets and more

Typical Properties:

Style	Weight ¹	Available Widths	Thickness ²	Thread Count ³ Per Inch				Yarn Type		Air ⁶ Permeability		Weave	Breaking Strength w/o Sizing			
				Warp		Fill		Warp	Fill	ft ³ ft ² /min	M ³ /min m ²		Warp		Fill	
				in	cm	in	cm						lbs in	kg cm	lbs in	kg cm
AF-62	30.4 oz/yd ² (1030 g/m ²)	4, 12, 30 in (.10, .31, .76 m)	.052 in (1.32 mm)	40	16	20	8	1/2 ⁵	1/2 ⁵	118	36	Double Layer	215	38	160	29
AF-40	25.0 oz/yd ² (847 g/m ²)	36 in (.91 m)	.035 in (.89 mm)	32	13	20	8	1/2 ⁵	1/2 ⁵	38	11.6	5 Harness Satin	250	45	160	29
AF-30	17.3 oz/yd ² (586 g/m ²)	36 in (.91 m)	.029 in (.74 mm)	19	7	18	7	1/2 ⁵	1/2 ⁵	52	15.8	Crow Foot Satin	180	32	160	29
AF-20	13.9 oz/yd ² (471 g/m ²)	36 in (.91 m)	.021 in (.53 mm)	30	12	26	10	Rov. ⁵	Rov. ⁵	20	6.1	5 Harness Satin	160	29	150	27
AF-14	8.6 oz/yd ² (291 g/m ²)	38 in (.97 m)	.014 in (.36 mm)	20	8	17	7	1/2 ⁴	1/2 ⁴	240	73	Plain	110	20	95	17

1. ± 10%

2. ± 20%

3. ± 2 end and 2 picks per inch

4. 900 denier yarn

5. 1800 denier yarn

6. 0.5 inch H₂O

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Fiber Properties:

Composition – Alumina-Boria-Silica

Density (non-porous) –
0.0975 lb/in³ (2.70 gm/cc)

Tensile Strength –
250 × 10³ psi (1720 mN/m²)

Continuous Use Temp. –
2200°F (1204°C)

Short Term Use Temp. –
2600°F (1426°C)

Melt Temp. – 3272°F (1800°C)

Other Characteristics – Non-oxidizing,
non-hygroscopic, essentially
chemically resistant, low thermal
conductivity, good abrasion
resistance

Important Processing Information

Nextel 312 Ceramic Fibers are coated during manufacture with sizings or finishes which serve as aids in textile processing. These sizings or finishes consist of organic polymers which may ignite and/or decompose to hazardous byproducts or process contaminants when first heated.

If Nextel 312 Ceramic Fibers are to be subjected to hot, humid environments for extended periods of time (e.g. 95°C, 100% relative humidity for ten days), heat treatment is necessary. The heat treatment changes the crystal structure of the fiber, preventing physical degradation in these conditions.

Heat cleaning and heat treating are available to meet your safety and process requirements. See our Nextel 312 Heat Cleaning/Heat Treating Instructions and our Health Safety Bulletin for more information.

PHYSICAL PROPERTIES

NEXTEL™ 312 Ceramic Fibers and NEXTEL™ 440 Ceramic Fibers from 3M are continuous polycrystalline metal oxide fibers suitable for producing textiles without the aid of other fiber or metal inserts. NEXTEL Fabrics, Tapes, and Sleeveings are exceptional, high temperature products designed to meet the toughest thermal, mechanical, and electrical performance requirements and to offer performance far beyond the useful limits of other high temperature textiles.

LOW SHRINKAGE

Because NEXTEL Yarns exhibit very low shrinkage, the dimensional stability of fabricated products from NEXTEL Textiles is excellent.

ABRASION RESISTANCE

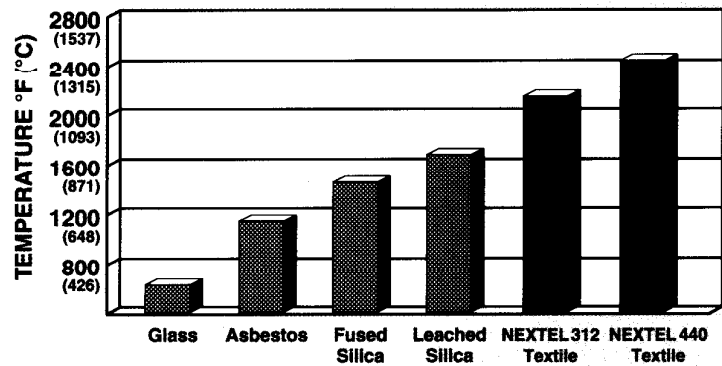
NEXTEL 312 Fibers demonstrated excellent abrasion resistance after one half hour exposure at up to 2000°F (1093°C). NEXTEL 312 Fibers lasted 2.5 to 5 times longer than leached glass in the Duplan Silk Abrasion Test.

Typical Fiber Properties

	NEXTEL 312 Fibers	NEXTEL 440 Fibers
Composition Weight % Al ₂ O ₃ SiO ₂ B ₂ O ₃	62% 24% 14%	70% 28% 2%
Color	White	White
Length	Continuous	Continuous
Filament Tensile Modulus of Elasticity	22 x 10 ⁶ psi (151,6 GPa)	27 x 10 ⁶ psi (186,1 GPa)
Filament Tensile Strength	250 x 10 ³ psi (1,72 GPa)	300 x 10 ³ psi (2,06 GPa)
Continuous Use Temperature	2200°F (1204°C)	2500°F (1371°C)
Short Term Use Temperature	2600°F (1426°C)	3000°F (1648°C)
First Liquid Phase	3100°F (1704°C)	3100°F (1704°C)
Liquidus Temperature	>3270°F (>1798°C)	>3270°F (>1798°C)
Surface Area	<305ft. ² /oz. (<1 m ² /g)	<305ft. ² /oz. (<1 m ² /g)
Nominal Filament Diameter	0.394 to 0.472 mil (10 to 12 micron)	0.394 to 0.472 mil (10 to 12 micron)
Refractive Index	1.570	1.617
Filament Density	0.097 lb./in ³ (2,69 g/cm ³)	0.11 lb./in ³ (3,05 g/cm ³)
Thermal Expansion Coefficient (25°C to 500°C)	3.0 x 10 ⁻⁶ ΔL/L/°C	4.38 x 10 ⁻⁶ ΔL/L/°C
Dielectric Constant	5.2 @ 9.375 x 10 ⁹ hz	5.7 @ 9.375 x 10 ⁹ hz

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Refractory Textile Temperature Limits



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Abrasion Resistance

Sample	Weave	Weight	Thickness	Stoll Flex & Abrasion Resistance*	
				w/sizing (Cycles to fail)	w/o sizing (Cycles to fail)
NEXTEL 312 Textile	harness satin	25 oz./yd ² (0,85 kg/m ²)	0.039 in. (0,99 mm)	1580	400
Leached Silica	harness satin	36 oz./yd. ² (1,22 kg/m ²)	0.054 in. (1,37 mm)	80	70
Fused Silica	harness satin	8.4 oz./yd. ² (0,28 kg/m ²)	0.014 in. (0,35 mm)	25	too brittle

*The samples were heated at 1472°F (800°C) for 1/2 hour to remove sizing or finish. The standard wear bar on the Stoll tester was replaced with a 1/4 inch (6.35 mm) hex bar for the tests on samples without sizing. The tension applied to the sample was 1/2 pound (0,226 kg) for all tests.

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