

### 3M<sup>®</sup> Nextel<sup>®</sup> Woven Ceramic Fabrics

Woven ceramic fabrics and woven industrial fabrics from 3M allow engineers and designers with high temperature applications to create new, imaginative solutions for previously impossible problems.

3M<sup>™</sup> Nextel<sup>™</sup> Woven Ceramic Fabrics are designed to meet the toughest thermal, mechanical and electrical performance requirements. Nextel Woven Ceramic Fabrics outperform the useful limits of other high temperature textiles such as aramids, carbon, glass or quartz. Nextel Woven Ceramic

Fabrics are engineered to perform at continuous temperatures up to 2200°F (1204°C).

When used in industrial furnaces, Nextel Woven Ceramic Fabrics can serve as thermal barriers to separate different temperature zones or the fabrics can serve to prevent particulate shedding.

Some typical applications of Nextel Woven Ceramic Fabrics are as follows:

Application	Fabric				
	3M <sup>®</sup> Nextel <sup>®</sup> Woven Fabric				
	312	440	550	610	720
<b>Aerospace</b>					
Radomes	✓	✓			
Thermal shields	✓	✓			
Micrometeorite debris shields	✓				
Ceramic-matrix composites			✓	✓	✓
Metal-matrix composites				✓	
Polymer-matrix composites	✓			✓	✓
<b>Automotive</b>	✓				
<b>Electronic</b>					
Diffusion furnaces			✓		
<b>Industrial</b>					
Furnace linings					
Galvanized steel furnaces					
Porcelain furnaces	✓	✓			
Furnace zone dividers	✓	✓			
Door seals	✓	✓		✓	
Tube seals	✓	✓			
Gaskets	✓	✓			
Expansion joints	✓				

### 3M™ Nextel™ Woven Fabric 312 - Typical Properties

Style	Weight (Sized)  oz/yd <sup>2</sup> (g/m <sup>2</sup> )	Available Width  inch (m)	Thickness (Sized)  inch (mm)	Thread Count		Yarn Type	Air Permeability w/o Sizing  ft <sup>3</sup> /min/ft <sup>2</sup> (l/min/dm <sup>2</sup> )	Weave	Breaking Strength without Sizing*	
				Warp per inch (cm)	Fill per inch (cm)				Warp lb/inch (kg/cm)	Fill lb/inch (kg/cm)
<b>Industrial</b>										
AF-10	8.6 (292)	38 (0,97)	0.015 (0,38)	46 (18)	46 (18)	600d served roving	15 (46)	5 harness satin	115 (20)	140 (25)
AF-11	7.6 (258)	38 (0,97)	0.010 (0,25)	24 (9)	23 (9)	1200d roving	40 (122)	Plain	120 (21)	135 (24)
AF-12	8.1 (275)	58 (1,47)	0.013 (0,33)	25 (10)	25 (10)	1200d roving	15 (46)	5 harness satin	130 (23)	150 (27)
AF-14	9.0 (305)	38 (0,97)	0.014 (0,36)	20 (8)	17 (7)	900d 1/2	30 (91)	Plain	150 (27)	135 (24)
AF-20	13.4 (454)	36 (0,91)	0.020 (0,51)	30 (12)	26 (10)	1800d roving	15 (46)	5 harness satin	170 (30)	150 (27)
AF-30	17.6 (597)	36 (0,91)	0.030 (0,76)	19 (7)	18 (7)	1800d 1/2	50 (152)	Crowfoot satin	200 (36)	180 (32)
AF-40	24.0 (814)	36 (0,91)	0.037 (0,94)	32 (13)	20 (8)	1800d 1/2	35 (107)	5 harness satin	300 (54)	190 (34)
AF-62	29.5 (1000)	4, 12, 30 (0,10; 0,30; 0,76)	0.054 (1,37)	40 (16)	20 (8)	1800d 1/2	100 (305)	Plain double layer	260 (46)	190 (34)
<b>Aerospace</b>										
AF-10	8.6 (292)	38 (0,97)	0.015 (0,38)	46 (18)	46 (18)	600d served roving	75 (229)	5 harness satin	220 (39)	220 (39)
AF-10 w/o sizing	7.2 (244)	38 (0,97)	0.010 (0,25)	46 (18)	46 (18)	600d served roving	15 (46)	5 harness satin	115 (20)	140 (25)
AF-11	7.6 (258)	38 (0,97)	0.010 (0,25)	24 (9)	23 (9)	1200d roving	75 (229)	Plain	140 (25)	140 (25)
AF-11 w/o sizing	7.4 (251)	38 (0,97)	0.009 (0,23)	24 (9)	23 (9)	1200d roving	40 (122)	Plain	120 (21)	135 (24)
AF-12	8.1 (275)	58 (1,47)	0.013 (0,33)	25 (10)	25 (10)	1200d roving	100 (305)	5 harness satin	220 (39)	220 (39)
AF-12 w/o sizing	7.9 (268)	58 (1,47)	0.011 (0,28)	25 (10)	25 (10)	1200d roving	15 (46)	5 harness satin	130 (23)	150 (27)

\* Tested at room temperature.

### 3M<sup>®</sup> Nextel<sup>®</sup> Woven Fabrics 440 - Typical Properties

Style	Weight (Sized)	Available Width	Thickness (Sized)	Thread Count		Yarn Type	Air Permeability w/o Sizing	Weave	Breaking Strength without Sizing*	
				Warp	Fill				Warp	Fill
	oz/yd <sup>2</sup> (g/m <sup>2</sup> )	inch (m)	inch (mm)	per inch (cm)	per inch (cm)		ft <sup>3</sup> /min/ft <sup>2</sup> (l/min/dm <sup>2</sup> )		lb/inch (kg/cm)	lb/inch (kg/cm)
<b>BF-20</b>	14.9 (505)	36 (0,91)	0.020 (0,51)	30 (12)	26 (10)	2000d roving	15 (46)	5 harness satin	250 (45)	220 (39)
<b>BF-30</b>	20.4 (692)	36 (0,91)	0.030 (0,76)	21 (8)	20 (8)	2000d 1/2	35 (107)	Crowfoot satin	290 (52)	260 (46)
<b>BF-40</b>	26.4 (895)	36 (0,91)	0.038 (0,97)	32 (13)	20 (8)	2000d 1/2	35 (107)	5 harness satin	340 (61)	260 (46)

### 3M<sup>®</sup> Nextel<sup>®</sup> Woven Fabric 550 - Typical Properties

Style	Weight (Sized)	Available Width	Thickness (Sized)	Thread Count		Yarn Type	Air Permeability w/o Sizing	Weave	Breaking Strength without Sizing*	
				Warp	Fill				Warp	Fill
	oz/yd <sup>2</sup> (g/m <sup>2</sup> )	inch (m)	inch (mm)	per inch (cm)	per inch (cm)		ft <sup>3</sup> /min/ft <sup>2</sup> (l/min/dm <sup>2</sup> )		lb/inch (kg/cm)	lb/inch (kg/cm)
<b>CF-40</b>	27.6 (936)	36 (0,91)	0.037 (0,94)	32 (13)	20 (8)	2000d 1/2	35 (107)	5 harness satin	340 (61)	260 (46)

### 3M<sup>®</sup> Nextel<sup>®</sup> Woven Fabrics 610 and 720 - Typical Properties

Style	Weight (Sized)	Available Width	Thickness (Sized)	Thread Count		Yarn Type	Air Permeability w/o Sizing	Weave	Breaking Strength without Sizing*	
				Warp	Fill				Warp	Fill
	oz/yd <sup>2</sup> (g/m <sup>2</sup> )	inch (m)	inch (mm)	per inch (cm)	per inch (cm)		ft <sup>3</sup> /min/ft <sup>2</sup> (l/min/dm <sup>2</sup> )		lb/inch (kg/cm)	lb/inch (kg/cm)
<b>610</b> <b>DF-11</b>	11.0 (373)	36 (0,91)	0.011 (0,28)	27.5 (11)	27.5 (11)	1500d roving	20 (61)	8 harness satin	230 (41)	260 (46)
<b>610</b> <b>DF-19</b>	19.3 (654)	36 (0,91)	.019 (0,48)	23.5 (9)	23.5 (9)	3000d roving	13 (40)	8 harness satin	300 (54)	260 (46)
<b>720</b> <b>XN-513</b>	11.2 (380)	36 (0,91)	0.013 (0,33)	27.5 (11)	27.5 (11)	1500d roving	20 (61)	8 harness satin	160 (29)	160 (29)
<b>720</b> <b>XN-625</b>	18.8 (637)	36 (0,91)	0.022 (0,56)	23.5 (9)	23.5 (9)	3000d roving	30 (91)	8 harness satin	180 (32)	180 (32)

\* Tested at room temperature.