

3M™ Nextel™ Ceramic Fiber Typical Properties

3M™ Nextel™ Ceramic Fiber 312, 440, and 550

Property	Units	Nextel™ 312	Nextel™ 440	Nextel™ 550
Sizing Color	color	white	coral	blue
Chemical Composition	wt. %	62.5 Al ₂ O ₃ 24.5 SiO ₂ 13 B ₂ O ₃	70 Al ₂ O ₃ 28 SiO ₂ 2 B ₂ O ₃	73 Al ₂ O ₃ 27 SiO ₂
Melting Point	°F (°C)	3272 (1800)	3272 (1800)	3272 (1800)
Filament Diameter	µm	10 – 12	10 - 12	10 – 12
Denier / Nominal Filament Count	g/9000 m	600 / 400 900 / 400 1800 / 750	700 / 400 1000 / 400 2000 / 750	1000 / 400 2000 / 750
Tex / Nominal Filament Count	g/1000 m	67 / 400 100 / 400 200 / 750	78 / 400 111 / 400 222 / 750	111 / 400 222 / 750
Crystal Size	nm	<500	<500	<500
Crystal Phase		Mullite + amorphous (or 100% amorphous)	γ-Al ₂ O ₃ + Mullite + amorphous SiO ₂	γ-Al ₂ O ₃ + amorphous SiO ₂
Density	g/cc	2.70	3.05	3.03
Refractive Index		1.568	1.614	1.602
Surface Area	m ² /g	<0.2	<0.2	<0.2
Filament Tensile Strength (25.4 mm gauge)	MPa ksi	1700 250	2000 290	2000 300
Filament Tensile Modulus	GPa msi	150 22	190 27	193 28
Thermal Expansion (100-1100°C)	ppm/°C	3 (25-500°C)	5.3	5.3
Dielectric Constant	(@ 9.375 GHz)	5.2	5.7	~5.8
Loss Tangent	(@ 9.375 GHz)	0.018	0.015	NA
Specific Heat @500°C (932°F)	cal/g/°C or BTU/lb/°F	0.25	0.27	NA

Typical property data is for engineering use only. Contact a 3M representative before developing a specification. See Important Notice to Purchaser for details.

3M™ Nextel™ Ceramic Fiber Typical Properties

3M™ Nextel™ Ceramic Fiber 610 and 720

Property	Units	Nextel™ 610	Nextel™ 720
Sizing Color	color	off-white	green
Chemical Composition	wt. %	>99 Al ₂ O ₃	85 Al ₂ O ₃ 15 SiO ₂
Melting Point	°F (°C)	3632 (2000)	3272 (1800)
Filament Diameter	µm	10 - 12	10 - 12
Denier / Nominal Filament Count	g/9000 m	1500/400 3000/750 10000/2550	1500/400 3000/750
Tex / Nominal Filament Count	g/1000 m	167/400 333/750 1111/2550	167/400 333/750
Crystal Size	nm	<500	<500
Crystal Phase		α-Al ₂ O ₃	α-Al ₂ O ₃ + Mullite
Density	g/cc	3.9	3.40
Refractive Index		1.74	1.67
Surface Area	m ² /g	<0.2	<0.2
Filament Tensile Strength (25.4 mm gauge)	MPa ksi	3100 450	2100 300
Filament Tensile Modulus	GPa msi	380 55	260 36
Thermal Expansion (100-1100°C)	ppm/°C	8.0	6.0
Dielectric Constant	(@ 9.375 GHz)	~9.0	~5.8
Loss Tangent	(@ 9.375 GHz)	NA	NA
Specific Heat @500°C (932°F)	cal/g/°C or BTU/lb/°F	TBD	TBD

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