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3M Advanced Materials Division

3M™ Nextel™ Ceramic Structural Rovings and Chopped Fibers 610 and 720

Introduction

3M™ Nextel™ Ceramic Structural Rovings and Chopped Fibers 610 and 720 are made from continuous ceramic fibers and are designed for structural applications where their primary purpose is to reinforce composites.

Rovings are a loose assemblage of fibers in a single strand without twists. **Chopped fibers** are short lengths of roving strands cut uniformly in length.

Nextel ceramic structural fibers 610 and 720 have crystal structures based on alpha alumina and alpha alumina/mullite, respectively.

Nextel ceramic structural fibers 610 are made from a fine grained single phase composition of alpha alumina, and have higher strength at room temperature than Nextel ceramic structural fibers 720. However, because they are essentially single phased, the strength decreases at lower temperature than 720 due to grain growth.

Nextel ceramic structural fibers 720 are made from an alpha alumina with SiO_2 added to have better strength retention at higher temperature due to reduced grain boundary sliding. Nextel 720 has higher creep resistance than Nextel 610 due to the presence of the mullite phase.

Typical Applications

Application	3M™ Nextel™ Ceramic Structural Rovings and Chopped Fibers	
	610	720
Creep Limit Temperature*	1832°F (1000°C)	2102°F (1150°C)
Ceramic Matrix Composites Applications requiring high oxidation resistant structural fibers with low creep		
Metal Matrix Composites Applications requiring high temperature resistant fibers that won't react with aluminum		
Polymer Matrix Composites Applications requiring non-conductive, electromagnetically transparent structural fibers		
Electrical Heater wire insulation, thermocouple insulation		

* Single filament ≤1 % strain under 69 MPa after 1000 hours.

Features and Benefits

- High strength/modulus
- Low elongation at operating temperatures
- Low shrinkage at operating temperatures
- Good chemical resistance
- Low thermal conductivity
- Thermal shock resistance
- Low porosity
- Broad electromagnetic transparency
- Electrically insulating

Important Processing Information

Sizing: Sizing is a processing aid applied to rovings to provide lubricity and binding action to protect the fibers and assist in handling. When first heated, the sizing may ignite and/or decompose to potentially hazardous byproducts or process contaminants. See Safety Data Sheet or contact 3M for more information.

Nextel ceramic rovings 610 are treated with 324 sizing which is composed of polyvinyl alcohol (PVA) and other additives, and have a white color.

Nextel ceramic rovings 720 are treated with 299 sizing which is composed of polyvinyl alcohol (PVA) and other additives.

Nextel ceramic rovings 610 and 720 may also be treated with an epoxy resin or water sizing upon request.

Additional Information

For additional information about 3M™ Nextel™ Ceramic Structural Rovings and Chopped Fibers 610 and 720, please call **1-800-367-8905**, or contact your local 3M representative.

Typical Properties (Not for specification purposes)

3M™ Nextel™ Ceramic Roving 610

Roving	Nominal Filament Count	Yield		Breaking Load*	
		yds/lb	m/kg	lbs	kg
1500 denier (167 tex)	400	2900	5900	12	5.5
3000 denier (333 tex)	750	1400	2900	20	9.1
4500 denier (500 tex)	1125	990	2000	24	11
10000 denier (1111 tex)	2550	440	880	31	14
20000 denier (2222 tex)	5100	220	440	45	20

Note: All yields are based upon sized rovings.
* Tested at room temperature.

3M™ Nextel™ Ceramic Roving 720

Roving	Nominal Filament Count	Yield		Breaking Load*	
		yds/lb	m/kg	lbs	kg
1500 denier (167 tex)	400	2900	5900	7	3.2
3000 denier (333 tex)	750	1400	2900	10	4.5
10000 denier (1111 tex)	2550	440	880	24	11

Note: All yields are based upon sized rovings and yarns.
* Tested at room temperature.

3M™ Nextel™ Ceramic Structural Chopped Fibers 610 and 720

Nextel ceramic rovings may be chopped to specified length. The following table lists standard fibers and lengths.

Cut Length		Fiber	
in	mm	Nextel 610	Nextel 720
1/8	3.2	✓	✓
1/4	6.4	✓	✓
1/2	12.7	✓	
1	25.4		✓

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3M Advanced Materials and Transportation
3M Center
St. Paul, MN 55144 USA

Phone 1-800-367-8905
Web www.3M.com/ceramics

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