

# Sumitomo Phenolic FM 4004F

Phenolic

Sumitomo Bakelite North America, Inc.

Message:

FM 4004F is a fiberglass and mineral reinforced phenolic novolac compound with improved strength properties over FM 4004. This compound exhibits excellent dimensional stability and good strength at elevated temperatures.

General Information			
UL YellowCard	E123472-221426		
Filler / Reinforcement	Glass Fiber		
	Mineral		
Features	Good Dimensional Stability		
	High Temperature Strength		
Appearance	Black		
	Green		
Forms	Granules		
Processing Method	Compression Molding		
	Injection Molding		
	Resin Transfer Molding		
Physical	Nominal Value	Unit	Test Method
Specific Gravity	1.88	g/cm <sup>3</sup>	ASTM D792
Apparent Density	0.98	g/cm <sup>3</sup>	ASTM D1895
Molding Shrinkage - Flow (Compression Molded)	0.23	%	ASTM D955
Water Absorption (24 hr)	0.070	%	ASTM D570
Water Absorption - 48 hr	0.15	%	ASTM D570
Hardness	Nominal Value	Unit	Test Method
Rockwell Hardness (E-Scale, Compression Molded)	123		ASTM D785
Mechanical	Nominal Value	Unit	Test Method
Tensile Strength (Compression Molded)	80.0	MPa	ASTM D638
Flexural Modulus (Compression Molded)	17100	MPa	ASTM D790
Flexural Strength (Compression Molded)	115	MPa	ASTM D790
Compressive Strength	230	MPa	ASTM D695
Impact	Nominal Value	Unit	Test Method
Notched Izod Impact (Compression Molded)	29	J/m	ASTM D256A

Thermal	Nominal Value	Unit	Test Method
Deflection Temperature Under Load			ASTM D648
1.8 MPa, Unannealed, Compression Molded	185	°C	
1.8 MPa, Annealed, Compression Molded	> 282	°C	
CLTE - Flow	1.9E-5	cm/cm/°C	ASTM E831
RTI Elec	150	°C	UL 746
RTI Imp	150	°C	UL 746
RTI Str	150	°C	UL 746
Electrical	Nominal Value	Unit	Test Method
Dielectric Strength <sup>1</sup>			ASTM D149
-- <sup>2</sup>	16	kV/mm	
-- <sup>3</sup>	14	kV/mm	
Dielectric Constant <sup>4</sup> (1 MHz)	4.60		ASTM D2520
Dissipation Factor <sup>5</sup> (1 MHz)	0.012		ASTM D150
Arc Resistance	180	sec	ASTM D495
Flammability	Nominal Value	Unit	Test Method
Flame Rating			UL 94
1.60 mm	V-0		
3.20 mm	V-0		
NOTE			
1.	Wet, 60 Hz		
2.	Method A (Short-Time)		
3.	Method B (Step-by-Step)		
4.	Wet		
5.	Wet		

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