

# Sumitomo Phenolic FM 4004

Phenolic

Sumitomo Bakelite North America, Inc.

Message:

FM 4004 is a fiberglass and mineral reinforced phenolic novolac compound. This compound exhibits excellent dimensional stability and good strength at elevated temperatures, and conforms to the requirements of ASTM D 5948, Type MFH.

General Information	
UL YellowCard	E123472-221425
Filler / Reinforcement	Glass Fiber
	Mineral
Features	Good Dimensional Stability
	High Temperature Strength
Agency Ratings	ASTM D 5948, Type MFH
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	0.88	g/cm <sup>3</sup>	ASTM D1895
Molding Shrinkage - Flow (Compression Molded)	0.20	%	ASTM D955
Water Absorption (24 hr)	0.10	%	ASTM D570
Water Absorption - 48 hr	0.15	%	ASTM D570
Hardness	Nominal Value	Unit	Test Method
Rockwell Hardness (E-Scale, Compression Molded)	110		ASTM D785
Mechanical	Nominal Value	Unit	Test Method
Tensile Strength (Compression Molded)	55.0	MPa	ASTM D638
Flexural Modulus (Compression Molded)	16900	MPa	ASTM D790
Flexural Strength (Compression Molded)	100	MPa	ASTM D790
Compressive Strength	262	MPa	ASTM D695
Impact	Nominal Value	Unit	Test Method

Notched Izod Impact (Compression Molded)	24	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	1.4E-5	cm/cm/°C	ASTM E831
Thermal Conductivity	0.54	W/m/K	ASTM C177
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>	12	kV/mm	
-- <sup>3</sup>	10	kV/mm	
Dielectric Constant <sup>4</sup> (1 MHz)	4.50		ASTM D2520
Dissipation Factor <sup>5</sup> (1 MHz)	0.020		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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