

## Sumitomo Bakelite North America FM 4004 Fiberglass and Mineral Reinforced Phenolic Novolac

Category : Polymer , Thermoset , Filled/Reinforced Thermoset , Phenolic , Phenolic, Novolac, Mineral/Glass Filled

### Material Notes:

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. Information supplied by Sumitomo Bakelite North America.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Sumitomo-Bakelite-North-America-FM-4004-Fiberglass-and-Mineral-Reinforced-Phenolic-Novolac.php](http://www.lookpolymers.com/polymer_Sumitomo-Bakelite-North-America-FM-4004-Fiberglass-and-Mineral-Reinforced-Phenolic-Novolac.php)

| Physical Properties   | Metric       | English                   | Comments           |
|-----------------------|--------------|---------------------------|--------------------|
| Bulk Density          | 0.875 g/cc   | 0.0316 lb/in <sup>3</sup> | Powder; ASTM D1895 |
| Density               | 1.88 g/cc    | 0.0679 lb/in <sup>3</sup> | ASTM D-792         |
| Water Absorption      | 0.10 %       | 0.10 %                    | 24 hour; ASTM D570 |
|                       | 0.15 %       | 0.15 %                    | 48 hour; ASTM D570 |
| Linear Mold Shrinkage | 0.0020 cm/cm | 0.0020 in/in              | ASTM D955          |

| Mechanical Properties      | Metric     | English        | Comments   |
|----------------------------|------------|----------------|------------|
| Hardness, Rockwell E       | 110        | 110            | ASTM D785  |
| Tensile Strength, Ultimate | 55.0 MPa   | 7980 psi       | ASTM D638  |
| Flexural Strength          | 100 MPa    | 14500 psi      | ASTM D790  |
| Flexural Modulus           | 16.9 GPa   | 2450 ksi       | ASTM D790  |
| Compressive Strength       | 262 MPa    | 38000 psi      | ASTM D695  |
| Izod Impact, Notched       | 0.240 J/cm | 0.450 ft-lb/in | ASTM D256A |

| Thermal Properties                          | Metric                                | English                                             | Comments                      |
|---------------------------------------------|---------------------------------------|-----------------------------------------------------|-------------------------------|
| CTE, linear, Parallel to Flow               | 14.0 $\mu\text{m/m-}^{\circ}\text{C}$ | 7.78 $\mu\text{in/in-}^{\circ}\text{F}$             | ASTM E831                     |
|                                             | @Temperature 20.0 $^{\circ}\text{C}$  | @Temperature 68.0 $^{\circ}\text{F}$                |                               |
| Thermal Conductivity                        | 0.540 W/m-K                           | 3.75 BTU-in/hr-ft <sup>2</sup> - $^{\circ}\text{F}$ | ASTM C518                     |
| Maximum Service Temperature, Air            | 150 $^{\circ}\text{C}$                | 302 $^{\circ}\text{F}$                              | UL Temperature Index; UL 746B |
| Deflection Temperature at 1.8 MPa (264 psi) | 185 $^{\circ}\text{C}$                | 365 $^{\circ}\text{F}$                              | As Molded; ASTM D648A         |

| Thermal Properties | $\geq 282^{\circ}\text{C}$<br>Metric | $\geq 540^{\circ}\text{F}$<br>English | Post Baked: ASTM D648A<br>Comments |
|--------------------|--------------------------------------|---------------------------------------|------------------------------------|
| Flammability, UL94 | V-0                                  | V-0                                   |                                    |
|                    | @Thickness 1.60 mm                   | @Thickness 0.0630 in                  |                                    |
|                    | V-0                                  | V-0                                   |                                    |
|                    | @Thickness 3.20 mm                   | @Thickness 0.126 in                   |                                    |

| Electrical Properties | Metric             | English            | Comments                  |
|-----------------------|--------------------|--------------------|---------------------------|
| Dielectric Constant   | 4.5                | 4.5                |                           |
|                       | @Frequency 1e+6 Hz | @Frequency 1e+6 Hz | Wet; ASTM D150            |
| Dielectric Strength   | 10.0 kV/mm         | 254 kV/in          | 60 Hz, wet, SS; ASTM D149 |
|                       | 12.0 kV/mm         | 305 kV/in          | ST; ASTM D149             |
| Dissipation Factor    | 0.020              | 0.020              |                           |
|                       | @Frequency 1e+6 Hz | @Frequency 1e+6 Hz | wet; ASTM D150            |
| Arc Resistance        | 180 sec            | 180 sec            | ASTM D495                 |

| Descriptive Properties   | Value                            | Comments |
|--------------------------|----------------------------------|----------|
| Available Molding Grades | Compression, Transfer, Injection |          |
| Color                    | Black, Green                     |          |
| Form                     | Granular                         |          |

## Contact Songhan Plastic Technology Co.,Ltd.

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