

## Iupilon™ EFR3000

Mitsubishi Engineering-Plastics Corp - Polycarbonate

| General Information                        |                                                        |                   |                                    |
|--------------------------------------------|--------------------------------------------------------|-------------------|------------------------------------|
| Product Description                        |                                                        |                   |                                    |
| Flame Retardant, Non Br & Non P, Opaque    |                                                        |                   |                                    |
| General                                    |                                                        |                   |                                    |
| Additive                                   | • Flame Retardant                                      |                   |                                    |
| Features                                   | • Bromine Free                                         | • Flame Retardant | • Low (to None) Phosphorus Content |
| Uses                                       | • Electrical/Electronic Applications • General Purpose |                   |                                    |
| Appearance                                 | • Opaque                                               |                   |                                    |
| ASTM & ISO Properties <sup>1</sup>         |                                                        |                   |                                    |
| Physical                                   | Nominal Value                                          | Unit              | Test Method                        |
| Density                                    | 1.19                                                   | g/cm³             | ISO 1183                           |
| Melt Mass-Flow Rate (MFR) (300°C/1.2 kg)   | 22                                                     | g/10 min          | ISO 1133                           |
| Melt Volume-Flow Rate (MVR) (300°C/1.2 kg) | 21                                                     | cm³/10min         | ISO 1133                           |
| Molding Shrinkage                          |                                                        |                   | Internal Method                    |
| Across Flow                                | 0.50 to 0.70                                           | %                 |                                    |
| Flow                                       | 0.50 to 0.70                                           | %                 |                                    |
| Water Absorption (24 hr, 23°C)             | 0.24                                                   | %                 | Internal Method                    |
| Mechanical                                 | Nominal Value                                          | Unit              | Test Method                        |
| Tensile Modulus                            | 2300                                                   | MPa               | ISO 527-1/1                        |
| Tensile Stress (Yield)                     | 61.0                                                   | MPa               | ISO 527-2/50                       |
| Tensile Strain                             |                                                        |                   | ISO 527-2/50                       |
| Yield                                      | 4.7                                                    | %                 |                                    |
| Break                                      | 67                                                     | %                 |                                    |
| Flexural Modulus <sup>2</sup>              | 2500                                                   | MPa               | ISO 178                            |
| Flexural Stress <sup>2</sup>               | 92.0                                                   | MPa               | ISO 178                            |
| Impact                                     | Nominal Value                                          | Unit              | Test Method                        |
| Charpy Notched Impact Strength (23°C)      | 50                                                     | kJ/m²             | ISO 179                            |
| Charpy Unnotched Impact Strength (23°C)    | No Break                                               |                   | ISO 179                            |
| Thermal                                    | Nominal Value                                          | Unit              | Test Method                        |
| Deflection Temperature Under Load          |                                                        |                   |                                    |
| 0.45 MPa, Unannealed                       | 137                                                    | °C                | ISO 75-2/B                         |
| 1.8 MPa, Unannealed                        | 125                                                    | °C                | ISO 75-2/A                         |
| CLTE                                       |                                                        |                   | ISO 11359-2                        |
| Flow                                       | 6.6E-5                                                 | cm/cm/°C          |                                    |
| Transverse                                 | 6.7E-5                                                 | cm/cm/°C          |                                    |



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| Electrical            | Nominal Value | Unit    | Test Method |
|-----------------------|---------------|---------|-------------|
| Surface Resistivity   | 6.0E+15       | ohms    | IEC 60093   |
| Volume Resistivity    | 3.0E+16       | ohms·cm | IEC 60093   |
| Electric Strength     |               |         | IEC 60243-1 |
| 1.00 mm               | 31            | kV/mm   |             |
| 3.00 mm               | 18            | kV/mm   |             |
| Dielectric Constant   |               |         | IEC 60250   |
| 1 MHz                 | 3.10          |         |             |
| 100 MHz               | 3.10          |         |             |
| Dissipation Factor    |               |         | IEC 60250   |
| 1 MHz                 | 9.0E-3        |         |             |
| 100 MHz               | 6.0E-4        |         |             |
| Flammability          | Nominal Value | Unit    | Test Method |
| Flame Rating (1.0 mm) | V-0           |         | UL 94       |

### Processing Information

| Injection                          | Nominal Value | Unit |
|------------------------------------|---------------|------|
| Drying Temperature - Hot Air Dryer | 120           | °C   |
| Drying Time - Hot Air Dryer        | 4.0 to 8.0    | hr   |
| Rear Temperature                   | 270 to 300    | °C   |
| Middle Temperature                 | 270 to 300    | °C   |
| Front Temperature                  | 270 to 300    | °C   |
| Nozzle Temperature                 | 270 to 300    | °C   |
| Mold Temperature                   | 70 to 100     | °C   |

