**Technical Data Sheet**

Bada since 1997 get the difference

# BADAMID® | PA12 SM-Z1 FR HF R1

PA12-I-FR

unreinforced, impact modified, halogenfree flame retardant polyamide 12 extrusion and injection moulding grade for railway applications

| Properties | Test conditions | Test method | Unit | dry as molded | conditioned 23 °C, 50 % r.F. |
|---|---|---|---|---|---|
| **Mechanical Properties** | | | | | |
| Tensile Modulus | 23°C, 1 mm/Min | ISO 527-1/2 | MPa | 1050 | - |
| Tensile Strength at yield | 23°C, 50 mm/Min | ISO 527-1/2 | MPa | 25 | - |
| Tensile strain at yield | 23°C, 50 mm/Min | ISO 527-1/2 | % | 16 | - |
| Nominal strain at break | 23°C, 50 mm/Min | ISO 527-1/2 | % | 130 | - |
| Tensile stress at break | 23°C, 5 mm/Min | ISO 527-1/2 | MPa | - | - |
| Tensile strain at break | 23°C, 5 mm/Min | ISO 527-1/2 | % | - | - |
| Flexural Modulus | 23°C | ISO 178 | MPa | - | - |
| Flexural Strength | 23°C | ISO 178 | MPa | - | - |
| Charpy Impact Strength | 23°C<br>-30°C | ISO 179/1eU<br>ISO 179/1eU | kJ/m²<br>kJ/m² | NB<br>NB | - |
| Charpy Notched Impact Strength | 23°C<br>-30°C | ISO 179/1eA<br>ISO 179/1eA | kJ/m²<br>kJ/m² | 7<br>- | - |
| Izod Notched Impact Strength | 23°C<br>-30°C | ISO 180/1A<br>ISO 180/1A | kJ/m²<br>kJ/m² | -<br>- | - |
| Ball indentation hardness | 358 N | ISO 2039-1 | MPa | - | - |
| **Thermal Properties** | | | | | |
| Melting temperature | 10 K/min | ISO 3146 | °C | 178 | |
| Temperature of deflection under load | 0,45 MPa<br>1,8 MPa<br>8 MPa | ISO 75-1/2<br>ISO 75-1/2<br>ISO 75-1/2 | °C<br>°C<br>°C | 125<br>70<br>- | |
| Coefficient of linear thermal expansion | parallel<br>across | ISO 11359-2<br>ISO 11359-2 | E-4/K<br>E-4/K | -<br>- | |
| Thermal conductivity | Test plate 2 mm | DIN 52612-1 | W/(m*K) | - | |
| Maximum service temperature (50% decrease in tensile strength) | some hours<br>20.000 h | IEC-60216<br>IEC-60216 | °C<br>°C | -<br>- | |
| Flammability | | UL94<br>UL94<br>UL94<br>UL94 | Wall thickness mm<br>Rating<br>Wall thickness mm<br>Rating | 1.5<br>V-0<br>-<br>- | |
| Glow wire test GWIT | | IEC-60695-2-13<br>IEC-60695-2-13<br>IEC-60695-2-13<br>IEC-60695-2-13 | Wall thickness mm<br>Temperature °C<br>Wall thickness mm<br>Temperature °C | -<br>-<br>-<br>- | |
| Glow wire test GWFI | | IEC-60695-2-12<br>IEC-60695-2-12<br>IEC-60695-2-12<br>IEC-60695-2-12 | Wall thickness mm<br>Temperature °C<br>Wall thickness mm<br>Temperature °C | -<br>-<br>-<br>- | |
| **Electrical Properties** | | | | | |
| Relative Permittivity | 1 MHz | IEC-62631-2-1 | - | - | - |
| Dissipation Factor | 1 MHz | IEC-62631-2-1 | E-4 | - | - |
| Spec. Volume Resistivity | - | IEC-62631-3-1 | Ohm*cm | - | - |

HongRong Engineering Plastics Co.,Ltd.
Head Office Tel. +85-2-6957-5415
Research Center Tel.+188 1699 6168

**Technical Data Sheet**

# BADAMID® | PA12 SM-Z1 FR HF R1

PA12-I-FR

unreinforced, impact modified, halogenfree flame retardant polyamide 12 extrusion and injection moulding grade for railway applications

| Properties | Test conditions | Test method | Unit | dry as molded | conditioned 23 °C, 50 % r.F. |
|---|---|---|---|---|---|
| Spec. Surface Resistivity | - | IEC-62631-3-2 | Ohm | - | - |
| Dielectric Strength | - | IEC-60243-1 | kV/mm | - | - |
| Comparative Tracking Index (CTI) | - | IEC-60112 | V | - | - |
| **Other Data** | | | | | |
| Water absorption | 23°C, Saturation | ISO 62 | % | 0.4 | |
| Moisture absorption | 23°C, 50% r.h. | ISO 62 | % | - | |
| Density | 23°C | ISO 1183 | g/cm³ | 1.1 | |
| Melt Volume Rate (MVR)<br><br><br> | Value<br>Temperature<br>Test Load | ISO 1133<br>ISO 1133<br>ISO 1133 | cm³/10min<br>°C<br>kg | -<br>-<br>- | |
| Viscosity number | 0,5% in 96% H2SO4 | ISO 307 | cm³/g | - | |
| **Processing injection molding** | | | | | |
| Melt temperature | | | °C | 220 - 260 | |
| Mold temperature | | | °C | 40 - 60 | |
| Guide Value Moisture | | | % | < 0.1 | |
| Drying temperature | | | °C | 80 | |
| Guide Value Drying time | | | h | 4 | |
| **Processing extrusion** | | | | | |
| Melt temperature | | | °C | 220 - 240 | |
| Guide Value Moisture | | | % | < 0.1 | |
| Drying temperature | | | °C | 80 | |
| Guide Value Drying time | | | h | 4 | |

HongRong Engineering Plastics Co.,Ltd.
Head Office Tel. +85-2-6957-5415
Research Center Tel.+188 1699 6168