# EXTEM™ Resin VH1003M

REGION AMERICAS

## DESCRIPTION

Transparent, Thermoplastic Polyimide (TPI) resin with a glass transition temperature (Tg) of 247C. Internal mold release. This product has thinwall FR capability and has a UL94 V0 listing. This material is RoHS compliant and also halogen free according VDE/DIN 472 part 815.

## TYPICAL PROPERTY VALUES

Revision 20261120

| PROPERTIES | TYPICAL VALUES | UNITS | TEST METHODS |
|---|---|---|---|
| MECHANICAL | | | |
| Tensile Stress, yld, Type I, 5 mm/min | 96 | MPa | ASTM D638 |
| Tensile Stress, brk, Type I, 5 mm/min | 96 | MPa | ASTM D638 |
| Tensile Strain, yld, Type I, 5 mm/min | 6 | % | ASTM D638 |
| Tensile Strain, brk, Type I, 5 mm/min | 50 | % | ASTM D638 |
| Tensile Modulus, 5 mm/min | 3510 | MPa | ASTM D638 |
| Flexural Stress, brk, 1.3 mm/min, 50 mm span | 158 | MPa | ASTM D790 |
| Flexural Stress, yld, 2.6 mm/min, 100 mm span | 155 | MPa | ASTM D790 |
| Flexural Modulus, 1.3 mm/min, 50 mm span | 3170 | MPa | ASTM D790 |
| Tensile Stress, yield, 5 mm/min | 95 | MPa | ISO 527 |
| Tensile Stress, break, 5 mm/min | 78 | MPa | ISO 527 |
| Tensile Strain, yield, 5 mm/min | 8.4 | % | ISO 527 |
| Tensile Strain, break, 5 mm/min | 20 | % | ISO 527 |
| Tensile Modulus, 1 mm/min | 3120 | MPa | ISO 527 |
| Flexural Stress, break, 2 mm/min | 123 | MPa | ISO 178 |
| Flexural Modulus, 2 mm/min | 3070 | MPa | ISO 178 |
| Ball Indentation Hardness, H358/30 | 138 | MPa | ISO 2039-1 |
| IMPACT | | | |
| Izod Impact, unnotched, 23°C | NB | J/m | ASTM D4812 |
| Izod Impact, notched, 23°C | 69 | J/m | ASTM D256 |
| Izod Impact, notched, -30°C | 74 | J/m | ASTM D256 |
| Instrumented Dart Impact Total Energy, 23°C | 33 | J | ASTM D3763 |
| Izod Impact, unnotched 80*10*4 +23°C | 196 | kJ/m² | ISO 180/1U |
| Izod Impact, unnotched 80*10*4 -30°C | 147 | kJ/m² | ISO 180/1U |
| Izod Impact, notched 80*10*4 +23°C | 6 | kJ/m² | ISO 180/1A |
| Izod Impact, notched 80*10*4 -30°C | 5 | kJ/m² | ISO 180/1A |
| Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm | NB | kJ/m² | ISO 179/1eU |
| Charpy -30°C, Unnotch Edgew 80*10*4 sp=62mm | NB | kJ/m² | ISO 179/1eU |
| THERMAL | | | |
| Vicat Softening Temp, Rate B/50 | 242 | °C | ASTM D1525 |
| HDT, 1.82 MPa, 3.2mm, unannealed | 217 | °C | ASTM D648 |
| HDT, 0.45 MPa, 6.4 mm, unannealed | 237 | °C | ASTM D648 |
| HDT, 1.82 MPa, 6.4 mm, unannealed | 230 | °C | ASTM D648 |
| CTE, -40°C to 150°C, flow | 5.E-05 | 1/°C | ASTM E831 |
| CTE, -40°C to 150°C, xflow | 5.E-05 | 1/°C | ASTM E831 |

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|---|---|---|---|
| Thermal Conductivity | 0.22 | W/m-°C | ASTM E1530 |
| CTE, 23°C to 150°C, flow | 5.E-05 | 1/°C | ISO 11359-2 |
| CTE, 23°C to 150°C, xflow | 5.E-05 | 1/°C | ISO 11359-2 |
| Ball Pressure Test, 125°C +/- 2°C | Passes | - | IEC 60695-10-2 |
| Vicat Softening Temp, Rate B/50 | 242 | °C | ISO 306 |
| Vicat Softening Temp, Rate B/120 | 240 | °C | ISO 306 |
| HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm | 228 | °C | ISO 75/Af |
| Relative Temp Index, Elec [1] | 160 | °C | UL 746B |
| Relative Temp Index, Mech w/impact [1] | 120 | °C | UL 746B |
| Relative Temp Index, Mech w/o impact [1] | 160 | °C | UL 746B |
| PHYSICAL | | | |
| Specific Gravity | 1.3 | - | ASTM D792 |
| Mold Shrinkage on Tensile Bar, flow | 0.5 – 0.7 | % | SABIC method |
| Mold Shrinkage, flow, 3.2 mm | 0.5 – 0.7 | % | SABIC method |
| Mold Shrinkage, xflow, 3.2 mm | 0.5 – 0.7 | % | SABIC method |
| Melt Flow Rate | | | |
| 367°C/6.6 kgf | 15.5 | g/10 min | ASTM D1238 |
| Density | 1.3 | g/cm³ | ISO 1183 |
| Water Absorption, (23°C/saturated) | 1.75 | % | ISO 62-1 |
| Moisture Absorption (23°C / 50% RH) | 0.65 | % | ISO 62 |
| Melt Volume Rate | | | |
| 360°C/5.0 kg | 8 | cm³/10 min | ISO 1133 |
| ELECTRICAL | | | |
| Dielectric Strength, in oil, 3.2 mm | 14 | kV/mm | ASTM D149 |
| Relative Permittivity, 100 Hz | 3.38 | - | ASTM D150 |
| Relative Permittivity, 1 kHz | 3.37 | - | ASTM D150 |
| Dissipation Factor | | | |
| 50/60 Hz | 0.018 | - | IEC 60250 |
| 100 Hz | 0.008 | - | IEC 60250 |
| 1 kHz | 0.001 | - | IEC 60250 |
| 1 MHz | 0.007 | - | IEC 60250 |
| Comparative Tracking Index | 175 | V | IEC 60112 |
| Comparative Tracking Index (UL) {PLC} | 3 | PLC Code | UL 746A |
| Hot-Wire Ignition (HWI), PLC 1 | ≥3 | mm | UL 746A |
| Hot-Wire Ignition (HWI), PLC 2 | ≥0.75 | mm | UL 746A |
| High Amp Arc Ignition (HAI), PLC 4 | ≥0.75 | mm | UL 746A |
| FLAME CHARACTERISTICS [1] | | | |
| UL Yellow Card Link | E121562-257957 | - | - |
| UL Recognized, 94V-0 Flame Class Rating | ≥0.75 | mm | UL 94 |
| Glow Wire Flammability Index 960°C, passes at | 3.2 | mm | IEC 60695-2-12 |
| Glow Wire Ignitability Temperature, 3.0 mm | 850 | °C | IEC 60695-2-13 |
| Oxygen Index (LOI) | 45 | % | ISO 4589 |
| INJECTION MOLDING | | | |
| Drying Temperature | 150 | °C | |
| Drying Time | 4 – 6 | Hrs | |

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|---|---|---|---|
| Drying Time (Cumulative) | 24 | Hrs | |
| Maximum Moisture Content | 0.02 | % | |
| Melt Temperature | 380 – 405 | °C | |
| Nozzle Temperature | 375 – 400 | °C | |
| Front - Zone 3 Temperature | 380 – 405 | °C | |
| Middle - Zone 2 Temperature | 370 – 395 | °C | |
| Rear - Zone 1 Temperature | 360 – 380 | °C | |
| Mold Temperature | 135 – 165 | °C | |
| Back Pressure | 0.3 – 0.7 | MPa | |
| Screw Speed | 40 – 70 | rpm | |
| Shot to Cylinder Size | 40 – 60 | % | |
| Vent Depth | 0.025 – 0.076 | mm | |

(1) UL Ratings shown on the technical datasheet might not cover the full range of thicknesses and colors. For details, please see the UL Yellow Card.

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