# EXTEM™ RESIN RH1016UCL

## DESCRIPTION

EXTEM RH1016UCL resin is an unreinforced amorphous Polyimide (PI) resin that may offer a high glass transition temperature (Tg) of 279°C. Features are excellent mechanical, electrical and dimensional properties up to high temperatures. The material has good near-IR transparency and a high refractive index making it an excellent candidate for SMT at JEDEC standard temperature of 260°C needing injection moldable optical lenses and connectors. The material is RoHS compliant and the natural, uncolored, material is halogen free according to standards IEC 61249-2-21, IPC 4101E and JEDEC JS709B. For colored variants compliance needs to be checked case by case.

| GENERAL INFORMATION | |
|---|---|
| **Features** | Flame Retardant, Chemical Resistance, Good Processability, High Flow, Low Warpage, Low Smoke and Toxicity, Thin Wall, Dielectrics, Amorphous, Low Shrinkage, IR Transparent, Lead free reflow soldering capable, Low Moisture Absorption, Transparent/Translucent, Non Cl/Br flame retardant, Non halogenated flame retardant, Low ionics/Outgassing/Liquid particle count, Creep resistant, Dimensional stability, High stiffness/Strength, High temperature resistance, No PFAS intentionally added |
| **Fillers** | Unreinforced |
| **Polymer Types** | Polyimide (PI) |
| **Processing Techniques** | SMT, Micro molding, Lead free soldering, Injection Molding |
| **Regional Availability** | Europe, Asia, Americas |

| INDUSTRY | SUB INDUSTRY |
|---|---|
| Electrical and Electronics | Mobile Phone - Computer - Tablets |
| Industrial | Electrical, Material Handling |

## TYPICAL PROPERTY VALUES

Revision 20240729

| PROPERTIES | TYPICAL VALUES | UNITS | TEST METHODS |
|---|---|---|---|
| MECHANICAL [1] | | | |
| **Flexural Stress, yld, 1.3 mm/min, 50 mm span** | 165 | MPa | ASTM D790 |
| **Flexural Modulus, 1.3 mm/min, 50 mm span** | 3000 | MPa | ASTM D790 |
| **Tensile Stress, break, 5 mm/min** | 75 | MPa | ISO 527 |
| **Tensile Strain, break, 5 mm/min** | 4 | % | ISO 527 |
| **Tensile Modulus, 1 mm/min** | 2870 | MPa | ISO 527 |
| IMPACT [1] | | | |
| **Izod Impact, unnotched, 23°C** | 900 | J/m | ASTM D4812 |
| **Izod Impact, notched, 23°C** | 50 | J/m | ASTM D256 |
| **Izod Impact, unnotched 80*10*4 +23°C** | 33 | kJ/m² | ISO 180/1U |
| **Izod Impact, notched 80*10*4 +23°C** | 2.5 | kJ/m² | ISO 180/1A |
| THERMAL [1] | | | |
| **Vicat Softening Temp, Rate B/50** | 272 | °C | ASTM D1525 |
| **HDT, 0.45 MPa, 3.2 mm, unannealed** | 263 | °C | ASTM D648 |
| **HDT, 1.82 MPa, 3.2mm, unannealed** | 252 | °C | ASTM D648 |
| **CTE, -20°C to 150°C, flow** | 4.9E-05 | 1/°C | ASTM E831 |
| **CTE, -20°C to 150°C, xflow** | 5.3E-05 | 1/°C | ASTM E831 |
| PHYSICAL [1] | | | |
| **Specific Gravity** | 1.35 | - | ASTM D792 |

| PROPERTIES | TYPICAL VALUES | UNITS | TEST METHODS |
|---|---|---|---|
| **Water Absorption, (23°C/24hrs)** | 0.55 | % | ASTM D570 |
| **Mold Shrinkage, flow, 3.2 mm** [2] | 1 – 1.2 | % | SABIC method |
| **Melt Flow Rate, 367°C/6.6 kgf** | 10 | g/10 min | ASTM D1238 |
| **OPTICAL** [1] | | | |
| **Light Transmission** | | | |
| at 1.0 mm and 850 nm | 82 | % | ASTM D1003 |
| **Refractive Index** | | | |
| at 850 nm | 1.663 | - | ISO 489 |
| at 1350 nm | 1.649 | - | ISO 489 |
| **Abbe number** | 17.6 | - | ISO 489 |
| **INJECTION MOLDING** [3] | | | |
| **Drying Temperature** | 175 | °C | |
| **Drying Time** | 6 – 8 | Hrs | |
| **Drying Time (Cumulative)** | 24 | Hrs | |
| **Maximum Moisture Content** | 0.02 | % | |
| **Melt Temperature** | 385 – 415 | °C | |
| **Nozzle Temperature** | 385 – 410 | °C | |
| **Front - Zone 3 Temperature** | 390 – 410 | °C | |
| **Middle - Zone 2 Temperature** | 390 – 405 | °C | |
| **Rear - Zone 1 Temperature** | 380 – 400 | °C | |
| **Mold Temperature** | 175 – 220 | °C | |
| **Intake (throat) temperature** | 70 – 100 | °C | |
| **Back pressure (Plastic Pressure)** | 5 – 10 | MPa | |
| **Screw speed (Circumferential speed)** | <0.2 | m/s | |
| **Shot to Cylinder Size** | 40 – 70 | % | |
| **Vent Depth** | 0.025 – 0.076 | mm | |

(1) The information stated on Technical Datasheets should be used as indicative only for material selection purposes and not be utilized as specification or used for part or tool design.

(2) Measurements made from laboratory test coupon. Actual shrinkage may vary outside of range due to differences in processing conditions, equipment, part geometry and tool design. It is recommended that mold shrinkage studies be performed with surrogate or legacy tooling prior to cutting tools for new molded article.

(3) Injection Molding parameters are only mentioned as general guidelines. These may not apply or may need adjustment in specific situations such as low shot sizes, large part molding, thin wall molding and gas-assist molding.

## DISCLAIMER