EXTEM™ RESIN RH1017UCL

DESCRIPTION

EXTEM™ RH1017UCL-1000 is a transparent, amorphous thermoplastic polyimide resin with high glass transition tempeture (Tg = 280 °C). This resin is near-IR transparent and injection moldable to produce complex optical lens assemblies while maintaining dimensional stability during 260 °C peak temperature through JEDEC-compliant solder reflow assembly process. Additional features are excellent mechanical, electrical and dimensional properties at high temperatures, including high refractive index similar to standard Ultem™. 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. ISCC+ certified renewable bio-based solutions are available for this grade via differentiated color nomenclature.

GENERAL INFORMATION	
Applications	Antenna, Data Management, Data Transfer, Electronic Components, Electronics, EV Infrastructure, Personal Computing, Wearables, Wireless Communications
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, Sustainable (bio-based offerings), Transparent/Translucent, Low ionics/Outgassing/Liquid particle count, Creep resistant, Dimensional stability, High stiffness/Strength, High temperature resistance, No PFAS intentionally added
Fillers	Unreinforced
Polymer Types	Thermoplastic Polyimide (TPI)
Processing Techniques	Micro molding, Film Extrusion, Injection Molding, Injection compression molding, Extrusion compression molding
Regional Availability	Europe, Asia, Americas

INDUSTRY	SUB INDUSTRY
Automotive	Automotive Under the Hood, Aerospace, Motorcycle
Electrical and Electronics	Energy Management, Electronic Components, Drone Solutions, Mobile Phone - Computer - Tablets, Circuit Boards/Additives, Lighting, Wireless Communication
Industrial	Electrical, Material Handling, Textile, Industrial Material Handling

TYPICAL PROPERTY VALUES

Revision 20250717

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL [1]			
Tensile Stress, break, 5 mm/min	75	MPa	ISO 527
Tensile Strain, break, 5 mm/min	3	%	ISO 527
Tensile Modulus, 5 mm/min	2900	MPa	ASTM D638
Flexural Modulus, 1.3 mm/min, 50 mm span	3100	MPa	ASTM D790
Flexural Stress, yld, 1.3 mm/min, 50 mm span	180	MPa	ASTM D790
Flexural Modulus, 2 mm/min	3000	MPa	ISO 178
Flexural Stress, break, 2 mm/min	152	MPa	ISO 178
IMPACT [1]			
Izod Impact, notched 80*10*4 +23°C	5	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	4	kJ/m²	ISO 180/1A
Izod Impact, notched, 23°C	40	J/m	ASTM D256
Izod Impact, unnotched, 23°C	1040	J/m	ASTM D4812
Izod Impact, unnotched 80*10*4 +23°C	50	kJ/m²	ISO 180/1U

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm	3	kJ/m²	ISO 179/1eA
Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm	60	kJ/m²	ISO 179/1eU
THERMAL [1]			
HDT, 1.82 MPa, 3.2mm, unannealed	255	°C	ASTM D648
HDT, 0.45 MPa, 3.2 mm, unannealed	270	°C	ASTM D648
Vicat Softening Temp, Rate B/50	250	°C	ASTM D1525
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
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	250	°C	ISO 75/Af
HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm	270	°C	ISO 75/Bf
Vicat Softening Temp, Rate B/50	278	°C	ISO 306
Vicat Softening Temp, Rate B/120	277	°C	ISO 306
PHYSICAL [1]			
Moisture Absorption (23°C / 50% RH)	0.9	%	ISO 62
Mold Shrinkage, flow [2]	1.0 – 1.1	%	SABIC method
Specific Gravity	1.24	-	ASTM D792
Water Absorption, (23°C/24hrs)	0.52	%	ASTM D570
Melt Flow Rate, 367°C/6.6 kgf	10	g/10 min	ASTM D1238
Density	1.24	g/cm³	ISO 1183
OPTICAL			
Light Transmission			
at 1350 nm (1mm)	88	%	ASTM D-1003
at 850 nm (1mm)	87	%	ASTM D-1003
Refractive Index			
at 1350 nm	1.627	-	ISO 489
at 850 nm	1.639	-	ISO 489
Abbe number	18	-	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 – 415	°C	
Front - Zone 3 Temperature	385 – 415	°C	
Middle - Zone 2 Temperature	385 – 410	°C	
Rear - Zone 1 Temperature	385 – 395	°C	
Mold Temperature	175 – 220	°C	
Intake (throat) temperature	90 – 120	°C	
Back pressure (Plastic Pressure)	5 – 10	MPa	
Screw speed (Circumferential speed)	≤0.2	m/s	
Shot to Cylinder Size	40 – 70	%	
Vent Depth	0.026 – 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.

ADDITIONAL PRODUCT NOTES

No PFAS intentionally added: The grade listed in this document does not contain PFAS intentionally added during Seller's manufacturing process and is not expected to contain unintentionally PFAS impurities. Each user is responsible for evaluating the presence of unintentional PFAS impurities.

DISCLAIMER