

# ULTEM™ RESIN 2310EPR

## DESCRIPTION

ULTEM 2310EPR resin is a further improved flow 30% glass fiber reinforced polyetherimide resin with an added internal mold release. The material is RoHS compliant and is intrinsically flame retardant without the use of FR modifiers and offers UL94 V0 and 5VA ratings. The material may offer excellent dimension stability, strength, stiffness and creep resistance up to high temperature due to its high glass transition temperature of 217°C. Beside enhanced flow the material offers enhanced metal adhesion in Electroplated applications. The material is opaque.

GENERAL INFORMATION	
Features	Flame Retardant, Chemical Resistance, Good Processability, High Flow, Hydrolytic Stability, Low Smoke and Toxicity, Thin Wall, Dielectrics, Amorphous, Low Shrinkage, Non halogenated flame retardant, Electroplatable, Enhanced mold release, Creep resistant, Dimensional stability, High stiffness/Strength, High temperature resistance, No PFAS intentionally added
Fillers	Glass Fiber
Polymer Types	Polyetherimide (PEI)
Processing Techniques	Injection Molding
Regional Availability	Europe, Asia, Americas

INDUSTRY	SUB INDUSTRY
Automotive	Heavy Truck, Automotive Under the Hood, Aerospace, Motorcycle, Recreational/Specialty Vehicles
Building and Construction	Building Component, Water Management
Consumer	Consumer Goods, Sport/Leisure, Personal Accessory, Home Appliances, Commercial Appliance, Furniture
Electrical and Electronics	Energy Management, Drone Solutions, Mobile Phone - Computer - Tablets, Circuit Boards/Additives, Lighting, Printer Copier, Speaker - Earphone, Wireless Communication
Hygiene and Healthcare	Personal and Professional Hygiene, Pharmaceutical Packaging and Drug Delivery, Surgical devices, General Healthcare, Patient Testing
Industrial	Electrical, Material Handling, Textile, Eyewear
Mass Transportation	Rail
Packaging	Industrial Packaging

## TYPICAL PROPERTY VALUES

Revision 20231109

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
<b>MECHANICAL <sup>(1)</sup></b>			
Tensile Stress, yld, Type I, 5 mm/min	158	MPa	ASTM D638
Tensile Stress, brk, Type I, 5 mm/min	158	MPa	ASTM D638
Tensile Strain, yld, Type I, 5 mm/min	2.1	%	ASTM D638
Tensile Strain, brk, Type I, 5 mm/min	2.1	%	ASTM D638
Tensile Modulus, 5 mm/min	8580	MPa	ASTM D638
Flexural Stress, yld, 1.3 mm/min, 50 mm span	228	MPa	ASTM D790
Flexural Modulus, 1.3 mm/min, 50 mm span	9140	MPa	ASTM D790
Tensile Stress, yield, 5 mm/min	160	MPa	ISO 527
Tensile Stress, break, 5 mm/min	160	MPa	ISO 527
Tensile Strain, yield, 5 mm/min	2	%	ISO 527
Tensile Strain, break, 5 mm/min	2	%	ISO 527
Tensile Modulus, 1 mm/min	8970	MPa	ISO 527

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Flexural Stress, yield, 2 mm/min	210	MPa	ISO 178
Flexural Modulus, 2 mm/min	9500	MPa	ISO 178
Ball Indentation Hardness, H358/30	160	MPa	ISO 2039-1
<b>IMPACT <sup>(1)</sup></b>			
Izod Impact, unnotched, 23°C	450	J/m	ASTM D4812
Izod Impact, notched, 23°C	85	J/m	ASTM D256
Instrumented Dart Impact Total Energy, 23°C	9	J	ASTM D3763
Izod Impact, unnotched 80*10*4 +23°C	35	kJ/m <sup>2</sup>	ISO 180/1U
Izod Impact, unnotched 80*10*4 -30°C	35	kJ/m <sup>2</sup>	ISO 180/1U
Izod Impact, notched 80*10*4 +23°C	10	kJ/m <sup>2</sup>	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	10	kJ/m <sup>2</sup>	ISO 180/1A
Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm	10	kJ/m <sup>2</sup>	ISO 179/1eA
Charpy -30°C, V-notch Edgew 80*10*4 sp=62mm	10	kJ/m <sup>2</sup>	ISO 179/1eA
Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm	30	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy -30°C, Unnotch Edgew 80*10*4 sp=62mm	35	kJ/m <sup>2</sup>	ISO 179/1eU
<b>THERMAL <sup>(1)</sup></b>			
Vicat Softening Temp, Rate B/50	217	°C	ASTM D1525
HDT, 0.45 MPa, 3.2 mm, unannealed	205	°C	ASTM D648
HDT, 1.82 MPa, 3.2mm, unannealed	201	°C	ASTM D648
HDT, 0.45 MPa, 6.4 mm, unannealed	208	°C	ASTM D648
HDT, 1.82 MPa, 6.4 mm, unannealed	205	°C	ASTM D648
CTE, -40°C to 150°C, flow	1.8E-05	1/°C	ASTM E831
CTE, -40°C to 150°C, xflow	3.E-05	1/°C	ASTM E831
Thermal Conductivity	0.31	W/m-°C	ISO 8302
CTE, 23°C to 150°C, flow	1.8E-05	1/°C	ISO 11359-2
CTE, 23°C to 150°C, xflow	3.E-05	1/°C	ISO 11359-2
Ball Pressure Test, 125°C +/- 2°C	PASS	-	IEC 60695-10-2
Vicat Softening Temp, Rate B/50	212	°C	ISO 306
Vicat Softening Temp, Rate B/120	214	°C	ISO 306
HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm	207	°C	ISO 75/Bf
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	196	°C	ISO 75/Af
Relative Temp Index, Elec <sup>(2)</sup>	105	°C	UL 746B
Relative Temp Index, Mech w/impact <sup>(2)</sup>	105	°C	UL 746B
Relative Temp Index, Mech w/o impact <sup>(2)</sup>	105	°C	UL 746B
<b>PHYSICAL</b>			
Specific Gravity	1.48	-	ASTM D792
Mold Shrinkage on Tensile Bar, flow <sup>(3)</sup>	0.3 – 0.5	%	SABIC method
Mold Shrinkage, flow, 3.2 mm <sup>(3)</sup>	0.4 – 0.6	%	SABIC method
Mold Shrinkage, xflow, 3.2 mm	0.4 – 0.6	%	SABIC method
Melt Flow Rate, 337°C/6.6 kgf	11	g/10 min	ASTM D1238
Density	1.48	g/cm <sup>3</sup>	ISO 1183
Water Absorption, (23°C/saturated)	0.9	%	ISO 62-1
Moisture Absorption (23°C / 50% RH)	0.5	%	ISO 62
Melt Volume Rate, MVR at 360°C/5.0 kg	12	cm <sup>3</sup> /10 min	ISO 1133
<b>ELECTRICAL <sup>(1) (2)</sup></b>			

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Comparative Tracking Index (UL) {PLC}	4	PLC Code	UL 746A
Hot-Wire Ignition (HWI), PLC 1	≥3	mm	UL 746A
Hot-Wire Ignition (HWI), PLC 2	≥1.5	mm	UL 746A
Hot-Wire Ignition (HWI), PLC 3	≥0.75	mm	UL 746A
Hot-Wire Ignition (HWI), PLC 4	≥0.4	mm	UL 746A
High Amp Arc Ignition (HAI), PLC 4	≥0.4	mm	UL 746A
High Voltage Arc Track Rate {PLC}	4	PLC Code	UL 746A
Arc Resistance, Tungsten {PLC}	6	PLC Code	ASTM D495
<b>FLAME CHARACTERISTICS <sup>(2)</sup></b>			
UL Yellow Card Link	<a href="#">E121562-221095</a>	-	-
UL Recognized, 94V-0 Flame Class Rating	≥0.4	mm	UL 94
<b>INJECTION MOLDING <sup>(4)</sup></b>			
Drying Temperature	150	°C	
Drying Time	4 – 6	Hrs	
Drying Time (Cumulative)	24	Hrs	
Maximum Moisture Content	0.02	%	
Melt Temperature	350 – 400	°C	
Nozzle Temperature	345 – 400	°C	
Front - Zone 3 Temperature	345 – 400	°C	
Middle - Zone 2 Temperature	340 – 400	°C	
Rear - Zone 1 Temperature	330 – 400	°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) 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) 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.

(3) 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.

(4) 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 unintentional PFAS impurities. Each user is responsible for evaluating the presence of unintentional PFAS impurities.

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