ULTEM™ RESIN 2310R

DESCRIPTION

ULTEM 2310R resin is an 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. The material is opaque and can be custom colored.

ISCC+ certified renewable bio-based solutions are available for this grade via differentiated color nomenclature."

GENERAL INFORMATION	
Features	Flame Retardant, Chemical Resistance, Good Processability, High Flow, Hydrolytic Stability, Low Warpage, Low Smoke and Toxicity, Thin Wall, Dielectrics, Amorphous, Low Shrinkage, Sustainable (bio-based offerings), 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	Large Format Additive Manufacturing (LFAM), Sheet extrusion, Injection Molding, Profile Extrusion, Extrusion, Compression 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 20230725

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL [1]			
Tensile Stress, break, 5 mm/min	175	MPa	ISO 527
Tensile Strain, break, 5 mm/min	2.4	%	ISO 527
Tensile Modulus, 1 mm/min	10500	MPa	ISO 527
Flexural Stress, break, 2 mm/min	240	MPa	ISO 178
Flexural Modulus, 2 mm/min	9600	MPa	ISO 178
Ball Indentation Hardness, H358/30	165	MPa	ISO 2039-1
Taber Abrasion, CS-17, 1 kg	20	mg/1000cy	SABIC method
Hardness, Rockwell M	110	-	ISO 2039-2
Tensile Stress, brk, Type I, 5 mm/min	175	MPa	ASTM D638
Tensile Strain, brk, Type I, 5 mm/min	2.5	%	ASTM D638

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Tensile Modulus, 5 mm/min	10400	MPa	ASTM D638
Flexural Stress, brk, 2.6 mm/min, 100 mm span	230	MPa	ASTM D790
Flexural Modulus, 2.6 mm/min, 100 mm span	9400	MPa	ASTM D790
Flexural Stress, brk, 1.3 mm/min, 50 mm span	250	MPa	ASTM D790
Flexural Modulus, 1.3 mm/min, 50 mm span	9700	MPa	ASTM D790
Hardness, Rockwell M	114	-	ASTM D785
IMPACT [1]			
Izod Impact, notched 80*10*4 +23°C	10	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	10	kJ/m²	ISO 180/1A
Izod Impact, unnotched 80*10*4 +23°C	40	kJ/m²	ISO 180/1U
Izod Impact, unnotched 80*10*4 -30°C	40	kJ/m²	ISO 180/1U
Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm	10	kJ/m²	ISO 179/1eA
Charpy -30°C, V-notch Edgew 80*10*4 sp=62mm	10	kJ/m²	ISO 179/1eA
Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm	40	kJ/m²	ISO 179/1eU
Charpy -30°C, Unnotch Edgew 80*10*4 sp=62mm	40	kJ/m²	ISO 179/1eU
Izod Impact, notched, 23°C	90	J/m	ASTM D256
Izod Impact, notched, -30°C	80	J/m	ASTM D256
Izod Impact, Reverse Notched, 3.2 mm	470	J/m	ASTM D256
Izod Impact, unnotched, 23°C	600	J/m	ASTM D4812
Izod Impact, unnotched, -30°C	600	J/m	ASTM D4812
THERMAL [1]			
HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm	215	°C	ISO 75/Bf
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	210	°C	ISO 75/Af
Vicat Softening Temp, Rate A/50	225	°C	ISO 306
Vicat Softening Temp, Rate B/120	220	°C	ISO 306
Vicat Softening Temp, Rate B/50	213	°C	ISO 306
CTE, -40°C to 150°C, flow	1.8E-05	1/°C	ISO 11359-2
CTE, -40°C to 150°C, xflow	4.8E-05	1/°C	ISO 11359-2
Thermal Conductivity	0.31	W/m-°C	ISO 8302
Ball Pressure Test, 125°C +/- 2°C	PASS	-	IEC 60695-10-2
HDT, 0.45 MPa, 3.2 mm, unannealed	215	°C	ASTM D648
HDT, 0.45 MPa, 6.4 mm, unannealed	212	°C	ASTM D648
HDT, 1.82 MPa, 3.2mm, unannealed	211	°C	ASTM D648
HDT, 1.82 MPa, 6.4 mm, unannealed	210	°C	ASTM D648
CTE, -20°C to 150°C, flow	1.8E-05	1/°C	ASTM E831
CTE, -20°C to 150°C, xflow	4.8E-05	1/°C	ASTM E831
Relative Temp Index, Elec [2]	180	°C	UL 746B
Relative Temp Index, Mech w/impact [2]	170	°C	UL 746B
Relative Temp Index, Mech w/o impact [2]	180	°C	UL 746B
PHYSICAL [1]			
Density	1.51	g/cm³	ISO 1183
Moisture Absorption, (23°C/50% RH/24hrs)	0.1	%	ISO 62-4
Moisture Absorption, (23°C/50% RH/Equilibrium)	0.6	%	ISO 62-4
Water Absorption, (23°C/24hrs)	0.16	%	ISO 62-1
Water Absorption, (23°C/saturated)	0.9	%	ISO 62-1

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Melt Volume Rate, MVR at 360°C/5.0 kg	8	cm³/10 min	ISO 1133
Specific Gravity	1.51	-	ASTM D792
Water Absorption, (23°C/24hrs)	0.16	%	ASTM D570
Water Absorption, (23°C/Saturated)	0.9	%	ASTM D570
Melt Flow Rate, 337°C/6.6 kgf	7.6	g/10 min	ASTM D1238
Mold Shrinkage, flow, 3.2 mm [3]	0.2 – 0.4	%	SABIC method
ELECTRICAL [1]			
Volume Resistivity	1.E+15	Ω.cm	IEC 60093
Surface Resistivity, ROA	>1.E+15	Ω	IEC 60093
Dielectric Strength, in oil, 0.8 mm	35	kV/mm	IEC 60243-1
Dielectric Strength, in oil, 1.6 mm	26	kV/mm	IEC 60243-1
Dielectric Strength, in oil, 3.2 mm	15	kV/mm	IEC 60243-1
Relative Permittivity, 50/60 Hz	3.3	-	IEC 60250
Relative Permittivity, 1 MHz	3.4	-	IEC 60250
Dissipation Factor, 50/60 Hz	0.0016	-	IEC 60250
Dissipation Factor, 1 MHz	0.0023	-	IEC 60250
Dielectric Constant [4]			
at 1.1 GHz	3.51	-	-
at 5 GHz	3.59	-	-
at 10 GHz	3.60	-	-
Dissipation Factor [4]			
at 1.1 GHz	0.0029	-	-
at 5 GHz	0.0036	-	-
at 10 GHz	0.0046	-	-
Comparative Tracking Index [5]	150	V	IEC 60112
Comparative Tracking Index, M [5]	100	V	IEC 60112
Volume Resistivity	3.E+16	Ω.cm	ASTM D257
Dielectric Strength, in air, 1.6 mm	24.8	kV/mm	ASTM D149
Dielectric Strength, in oil, 1.6 mm	30.3	kV/mm	ASTM D149
Relative Permittivity, 1 kHz	3.7	-	ASTM D150
Dissipation Factor, 1 kHz	0.0015	-	ASTM D150
Comparative Tracking Index (UL) {PLC} [2]	4	PLC Code	UL 746A
Hot-Wire Ignition (HWI), PLC 1 [2]	≥3	mm	UL 746A
Hot-Wire Ignition (HWI), PLC 3 [2]	≥1.5	mm	UL 746A
High Amp Arc Ignition (HAI), PLC 3 [2]	≥1.5	mm	UL 746A
High Amp Arc Ignition (HAI), PLC 4 [2]	≥3	mm	UL 746A
High Voltage Arc Track Rate {PLC} [2]	3	PLC Code	UL 746A
Arc Resistance, Tungsten {PLC} [2]	6	PLC Code	ASTM D495
FLAME CHARACTERISTICS [2]			
UL Yellow Card Link	E121562-221099	-	-
UL Yellow Card Link 2	E121562-470961	-	-
UL Recognized, 94-5VA Flame Class Rating	≥1.2	mm	UL 94
UL Recognized, 94V-0 Flame Class Rating	≥0.25	mm	UL 94
Glow Wire Ignitability Temperature, 2.0 mm	900	°C	IEC 60695-2-13
Glow Wire Flammability Index, 2.0 mm	960	°C	IEC 60695-2-12

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
UV-light, water exposure/immersion	F1	-	UL 746C
Oxygen Index (LOI)	48	%	ISO 4589
INJECTION MOLDING [6]			
Drying Temperature	150	°C	
Drying Time	4 – 6	Hrs	
Drying Time (Cumulative)	24	Hrs	
Maximum Moisture Content	0.02	%	
Melt Temperature	350 – 410	°C	
Nozzle Temperature	345 – 410	°C	
Front - Zone 3 Temperature	345 – 420	°C	
Middle - Zone 2 Temperature	340 – 410	°C	
Rear - Zone 1 Temperature	330 – 400	°C	
Hopper Temperature	80 – 120	°C	
Mold Temperature	135 – 180	°C	
Shot to Cylinder Size	40 – 60	%	
Vent Depth	0.025 – 0.076	mm	
Screw speed (Circumferential speed)	0.15 – 0.25	m/s	
Screw Speed	40 – 70	rpm	
Back Pressure	0.3 – 1.5	MPa	

(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) Based on SPDR testing technique on dry as molded specimens.
(5) Value shown here is based on internal measurement.
(6) 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.

MORE INFORMATION

For curve data and CAE cards, please visit and register at https://materialfinder.sabic-specialties.com

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