

ULTEM™ 1000 resin

Polyether Imide
SABIC Innovative Plastics

Message:

ULTEM™ 1000 resin is an amorphous, transparent polyetherimide (PEI) plastic offering a glass transition temperature (Tg) of 217°C. This inherently flame retardant resin has UL94 V0, V2 and 5VA ratings and is RoHS compliant. ULTEM™ 1000 resin is an unreinforced general purpose grade offering high heat resistance, high strength and modulus and broad chemical resistance up to high temperatures.

General Information			
UL YellowCard	E121562-101048254		
Features	High strength		
	Good chemical resistance		
	Heat resistance, high		
	General		
	amorphous		
	Flame retardancy		
Uses	General		
Appearance	Clear/transparent		
Processing Method	Extrusion blow molding		
	Injection molding		
Multi-Point Data	Coefficient of Thermal Expansion vs. Temperature (ASTM E831)		
	Compressive Stress vs. Strain (ASTM D695)		
	Elastic Modulus vs Temperature (ASTM D4065)		
	Flexural DMA (ASTM D4065)		
	Instrumented Impact (Energy) (ASTM D3763)		
	Instrumented Impact (Load) (ASTM D3763)		
	Pressure-Volume-Temperature (PVT - Zoller Method)		
	Shear DMA (ASTM D4065)		
	Specific Heat vs. Temperature (ASTM D3417)		
	Tensile Creep (ASTM D2990)		
	Tensile Fatigue		
	Tensile Stress vs. Strain (ASTM D638)		
	Thermal Conductivity vs. Temperature (ASTM E1530)		
	Viscosity vs. Shear Rate (ASTM D3835)		
Physical	Nominal Value	Unit	Test Method
Specific Gravity	1.27	g/cm³	ASTM D792
Melt Mass-Flow Rate (MFR) (337°C/6.6 kg)	9.0	g/10 min	ASTM D1238
Molding Shrinkage - Flow (3.20 mm)	0.50 - 0.70	%	Internal method

Water Absorption			ASTM D570
24 hr	0.25	%	ASTM D570
Equilibrium, 23°C	1.3	%	ASTM D570
Hardness	Nominal Value	Unit	Test Method
Rockwell Hardness (M-Scale)	109		ASTM D785
Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus ¹	3590	MPa	ASTM D638
Tensile Strength ² (Yield)	110	MPa	ASTM D638
Tensile Elongation ³			ASTM D638
Yield	7.0	%	ASTM D638
Fracture	60	%	ASTM D638
Flexural Modulus ⁴ (100 mm Span)	3520	MPa	ASTM D790
Flexural Strength ⁵ (Yield, 100 mm Span)	165	MPa	ASTM D790
Poisson's Ratio	0.36		ASTM D638
Taber Abrasion Resistance (1000 Cycles, 1000 g, CS-17 Wheel)	10.0	mg	ASTM D1044
Impact	Nominal Value	Unit	Test Method
Notched Izod Impact (23°C)	53	J/m	ASTM D256
Unnotched Izod Impact (23°C)	1300	J/m	ASTM D4812
Reverse Notch Izod Impact (3.20 mm)	1300	J/m	ASTM D256
Dart Drop Impact (23°C)	36.6	J	ASTM D3029
Thermal	Nominal Value	Unit	Test Method
Deflection Temperature Under Load			ASTM D648
0.45 MPa, unannealed, 6.40mm	210	°C	ASTM D648
1.8 MPa, unannealed, 6.40mm	201	°C	ASTM D648
Vicat Softening Temperature	219	°C	ASTM D1525 ⁶
Linear thermal expansion coefficient			ASTM E831
Flow: -20 to 150°C	5.6E-5	cm/cm/°C	ASTM E831
Lateral: -20 to 150°C	5.4E-5	cm/cm/°C	ASTM E831
Thermal Conductivity	0.22	W/m/K	ASTM C177
RTI Elec	170	°C	UL 746
RTI Imp	170	°C	UL 746
RTI	170	°C	UL 746
Electrical	Nominal Value	Unit	Test Method
Volume Resistivity	1.0E+17	ohms · cm	ASTM D257
Dielectric Strength			ASTM D149
1.60 mm, in Air	33	kV/mm	ASTM D149
1.60 mm, in Oil	28	kV/mm	ASTM D149
3.20 mm, in Oil	20	kV/mm	ASTM D149
Dielectric Constant			ASTM D150
100 Hz	3.15		ASTM D150
1 kHz	3.15		ASTM D150

Dissipation Factor			ASTM D150
100 Hz	1.5E-3		ASTM D150
1 kHz	1.2E-3		ASTM D150
2.45 GHz	2.5E-3		ASTM D150
Arc Resistance ⁷	PLC 5		ASTM D495
Comparative Tracking Index (CTI)	PLC 4		UL 746
High Amp Arc Ignition (HAI)	PLC 3		UL 746
High Voltage Arc Tracking Rate (HVTR)	PLC 2		UL 746
Hot-wire Ignition (HWI)	PLC 1		UL 746
Flammability	Nominal Value	Unit	Test Method
Flame Rating			UL 94
0.400 mm	V-2		UL 94
0.750 mm	V-0		UL 94
3.00 mm	5VA		UL 94
Oxygen Index	47	%	ASTM D2863
NBS Smoke Density - Flaming, Ds, 4 min	0.700		ASTM E662
Injection	Nominal Value	Unit	
Drying Temperature	149	°C	
Drying Time	4.0 - 6.0	hr	
Drying Time, Maximum	24	hr	
Suggested Max Moisture	0.020	%	
Suggested Shot Size	40 - 60	%	
Rear Temperature	332 - 399	°C	
Middle Temperature	338 - 399	°C	
Front Temperature	343 - 399	°C	
Nozzle Temperature	343 - 399	°C	
Processing (Melt) Temp	349 - 399	°C	
Mold Temperature	135 - 163	°C	
Back Pressure	0.345 - 0.689	MPa	
Screw Speed	40 - 70	rpm	
Vent Depth	0.025 - 0.076	mm	
Extrusion	Nominal Value	Unit	
Drying Temperature	138 - 149	°C	
Drying Time	4.0 - 6.0	hr	
Suggested Max Moisture	0.010 - 0.020	%	
Cylinder Zone 1 Temp.	324 - 349	°C	
Cylinder Zone 2 Temp.	329 - 357	°C	
Cylinder Zone 3 Temp.	329 - 357	°C	
Cylinder Zone 4 Temp.	329 - 357	°C	
Cylinder Zone 5 Temp.	329 - 357	°C	
Adapter Temperature	329 - 357	°C	
Die Temperature	327 - 357	°C	

Extrusion instructions

Drying Time (Cumulative): 24 hrs
Head - Zone 6 - Top Temperature: 329 - 357 °C
Head - Zone 7 - Bottom Temperature: 329 - 357 °C
Melt Temperature (Parison): 321 - 357 °C
Mold Temperature: 66 - 177 °C
Screw Speed: 10 - 70 rpm

NOTE

1.	5.0 mm/min
2.	Type 1, 5.0 mm/min
3.	Type 1, 5.0 mm/min
4.	2.6 mm/min
5.	2.6 mm/min
6.	标准 B (120°C/h), 载荷2 (50N)
7.	Tungsten electrode

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