ULTEM* 1000 Resin

SABIC Innovative Plastics - Polyether Imide

Wednesday, February 11, 2009

General Information

Product Description

Transparent, standard flow Polyetherimide (Tg 217C). ECO Conforming, UL94 V0 and 5VA listing. US FDA and EU Food Contact compliant, NSF 51 listing, compliant in natural color. Effective June, 2007 this grade will no longer be supported with biocompatibility information and should not be used for medical applications which require biocompatibility. Alternative grade HU1000.

General

Material Status	• Commercial: Active	
Availability	• North America	
Features	• ECO Compliant	• Food Contact Acceptable
Agency Ratings	• EU Eco • EU Food Contact, Unspecified Rating	• FDA Food Contact, Unspecified Rating • NSF 51
Appearance	• Clear/Transparent	
Forms	• Pellets	
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)	

ASTM and ISO Properties [1]

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 to 0.70	%	ASTM D955
Water Absorption			ASTM D570
24 hr	0.25	%	
Equilibrium, 23°C	1.3	%	

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Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus [2]	3590	MPa	ASTM D638
Tensile Strength [3] (Yield)	110	MPa	ASTM D638
Tensile Elongation [3]			ASTM D638
Yield	7.0	%	
Break	60	%	
Flexural Modulus [4] (100 mm Span)	3520	MPa	ASTM D790
Flexural Strength [4] (Yield, 100 mm Span)	165	MPa	ASTM D790
Poisson's Ratio	0.36		ASTM D638
Taber Abrasion Resistance			ASTM D1044
1000 Cycles, 1000 g, CS-17 Wheel	10.0	mg	

Impact	Nominal Value	Unit	Test Method
Notched Izod Impact (23°C)	53.4	J/m	ASTM D256
Unnotched Izod Impact (23°C)	1330	J/m	ASTM D4812
Reverse Notch Izod Impact (3.20 mm)	1300	J/m	ASTM D256
Gardner Impact (23°C)	36.6	J	ASTM D3029

Hardness	Nominal Value	Unit	Test Method
Rockwell Hardness (M-Scale)	109		ASTM D785

Thermal	Nominal Value	Unit	Test Method
Deflection Temperature Under Load			ASTM D648
0.45 MPa, Unannealed, 6.40 mm	210	°C	
1.8 MPa, Unannealed, 6.40 mm	201	°C	
Vicat Softening Temperature	219	°C	ASTM D1525 [5]
CLTE			ASTM E831
Flow: -20 to 150°C	0.000056	cm/cm/°C	
Transverse: -20 to 150°C	0.000054	cm/cm/°C	
Thermal Conductivity	0.22	W/m/K	ASTM C177

Electrical	Nominal Value	Unit	Test Method
Volume Resistivity	1.0E+17	ohm·cm	ASTM D257
Dielectric Strength			ASTM D149
1.60 mm, in Air	32.7	kV/mm	
1.60 mm, in Oil	28.0	kV/mm	
3.20 mm, in Oil	19.7	kV/mm	
Dielectric Constant			ASTM D150
100 Hz	3.150		
1000 Hz	3.150		
Dissipation Factor			ASTM D150
100 Hz	0.0015		
1000 Hz	0.0012		
2E+9 Hz	0.0025		
Arc Resistance (PLC) [6]	PLC 5		ASTM D495

Flammability	Nominal Value	Unit	Test Method
Oxygen Index	47	%	ASTM D2863

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UL 746	Nominal Value	Unit	Test Method
RTI Str	170	°C	UL 746
RTI Imp	170	°C	UL 746
RTI Elec	170	°C	UL 746
Comparative Tracking Index (CTI) (PLC)	PLC 4		UL 746
High Voltage Arc Tracking Rate (HVTR) (PLC)	PLC 2		UL 746
Hot-wire Ignition (HWI) (PLC)	PLC 1		UL 746
High Amp Arc Ignition (HAI) (PLC)	PLC 3		UL 746

Additional Information	Nominal Value	Unit	Test Method
CSA File No. (See file for complete listing)	LS88480		CSA
NBS Smoke Density (Flaming, Ds, 4 min)	0.700		ASTM E662

Processing Information

Injection	Nominal Value	Unit
Drying Temperature	149	°C
Drying Time	4.0 to 6.0	hr
Drying Time, Maximum	24	hr
Suggested Max Moisture	0.020	%
Suggested Shot Size	40 to 60	%
Rear Temperature	332 to 399	°C
Middle Temperature	338 to 399	°C
Front Temperature	343 to 399	°C
Nozzle Temperature	343 to 399	°C
Processing (Melt) Temp	349 to 399	°C
Mold Temperature	135 to 163	°C
Back Pressure	0.345 to 0.689	MPa
Screw Speed	40 to 70	rpm
Vent Depth	0.025 to 0.076	mm

Extrusion	Nominal Value	Unit
Drying Temperature	138 to 149	°C
Drying Time	4.0 to 6.0	hr
Suggested Max Moisture	0.0100 to 0.020	%
Cylinder Zone 1 Temp.	324 to 349	°C
Cylinder Zone 2 Temp.	329 to 357	°C
Cylinder Zone 3 Temp.	329 to 357	°C
Cylinder Zone 4 Temp.	329 to 357	°C
Adapter Temperature	329 to 357	°C
Die Temperature	327 to 357	°C

Extrusion Notes

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

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Notes

[1] Typical properties: these are not to be construed as specifications.

[2] 5.0 mm/min

[3] Type I, 5.0 mm/min

[4] 2.6 mm/min

[5] Rate B (120°C/h), Loading 2 (50 N)

[6] Tungsten Electrode