

# ULTEM™ RESIN VH1003F

REGION EUROPE

## DESCRIPTION

Transparent, Thermoplastic Polyimide (TPI) resin. Glass transition Temp. (Tg) of 247°C. Global Food Contact Approval. Resin is subject to Commerce Control Laws U.S. 15CFR Chapter VII, Part 774 and Annex I of Reg. EC 428/2009 as ECCN1C008. RoHS compliant.

## TYPICAL PROPERTY VALUES

Revision 20170913

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
<b>MECHANICAL</b>			
Tensile Stress, yld, Type I, 5 mm/min	96	MPa	ASTM D 638
Tensile Stress, brk, Type I, 5 mm/min	96	MPa	ASTM D 638
Tensile Strain, yld, Type I, 5 mm/min	6	%	ASTM D 638
Tensile Strain, brk, Type I, 5 mm/min	50	%	ASTM D 638
Tensile Modulus, 5 mm/min	3510	MPa	ASTM D 638
Flexural Stress, brk, 1.3 mm/min, 50 mm span	159	MPa	ASTM D 790
Flexural Stress, yld, 2.6 mm/min, 100 mm span	155	MPa	ASTM D 790
Flexural Modulus, 1.3 mm/min, 50 mm span	3170	MPa	ASTM D 790
Tensile Stress, yield, 5 mm/min	95	MPa	ISO 527
Tensile Stress, break, 5 mm/min	78	MPa	ISO 527
Tensile Strain, yield, 5 mm/min	8.5	%	ISO 527
Tensile Strain, break, 5 mm/min	50	%	ISO 527
Tensile Modulus, 1 mm/min	3110	MPa	ISO 527
Flexural Stress, yield, 2 mm/min	123	MPa	ISO 178
Flexural Modulus, 2 mm/min	3080	MPa	ISO 178
Hardness, H358/30	140	MPa	ISO 2039-1
<b>IMPACT</b>			
Izod Impact, unnotched, 23°C	NB	J/m	ASTM D 4812
Izod Impact, notched, 23°C	69	J/m	ASTM D 256
Izod Impact, notched, -30°C	74	J/m	ASTM D 256
Instrumented Impact Total Energy, 23°C	33	J	ASTM D 3763
Izod Impact, unnotched 80*10*4 +23°C	NB	kJ/m <sup>2</sup>	ISO 180/1U
Izod Impact, unnotched 80*10*4 -30°C	NB	kJ/m <sup>2</sup>	ISO 180/1U
Izod Impact, notched 80*10*4 +23°C	4	kJ/m <sup>2</sup>	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	5	kJ/m <sup>2</sup>	ISO 180/1A
Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm	NB	kJ/m <sup>2</sup>	ISO 179/1eU

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Charpy -30°C, Unnotch Edgew 80*10*4 sp=62mm	NB	kJ/m <sup>2</sup>	ISO 179/1eU
<b>THERMAL</b>			
Vicat Softening Temp, Rate B/50	242	°C	ASTM D 1525
HDT, 1.82 MPa, 3.2mm, unannealed	217	°C	ASTM D 648
HDT, 0.45 MPa, 6.4 mm, unannealed	237	°C	ASTM D 648
HDT, 1.82 MPa, 6.4 mm, unannealed	230	°C	ASTM D 648
CTE, -40°C to 150°C, flow	5.E-05	1/°C	ASTM E 831
CTE, -40°C to 150°C, xflow	5.E-05	1/°C	ASTM E 831
Thermal Conductivity	0.22	W/m-°C	ASTM E 1530
CTE, 23°C to 150°C, flow	5.E-05	1/°C	ISO 11359-2
CTE, 23°C to 150°C, xflow	5.E-05	1/°C	ISO 11359-2
Ball Pressure Test, 125°C +/- 2°C	Passes	-	IEC 60695-10-2
Vicat Softening Temp, Rate B/50	242	°C	ISO 306
Vicat Softening Temp, Rate B/120	238	°C	ISO 306
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	228	°C	ISO 75/Af
<b>PHYSICAL</b>			
Specific Gravity	1.3	-	ASTM D 792
Mold Shrinkage on Tensile Bar, flow (2) (5)	0.5 – 0.7	%	SABIC method
Mold Shrinkage, flow, 3.2 mm (5)	0.5 – 0.7	%	SABIC method
Mold Shrinkage, xflow, 3.2 mm (5)	0.5 – 0.7	%	SABIC method
Melt Flow Rate, 367°C/6.6 kgf	15.5	g/10 min	ASTM D 1238
Density	1.3	g/cm <sup>3</sup>	ISO 1183
Water Absorption, (23°C/sat)	1.75	%	ISO 62
Moisture Absorption (23°C / 50% RH)	0.6	%	ISO 62
Melt Volume Rate, MVR at 360°C/5.0 kg	8	cm <sup>3</sup> /10 min	ISO 1133
<b>OPTICAL</b>			
Light Transmission, 2.54 mm	58	%	ASTM D 1003
Haze, 2.54 mm	2	%	ASTM D 1003
<b>ELECTRICAL</b>			
Dielectric Strength, in oil, 3.2 mm	17	kV/mm	ASTM D 149
Relative Permittivity, 100 Hz	3.41	-	ASTM D 150
Relative Permittivity, 1 kHz	3.41	-	ASTM D 150
Dissipation Factor, 50/60 Hz	0.025	-	IEC 60250
Dissipation Factor, 100 Hz	0.008	-	IEC 60250
Dissipation Factor, 1 kHz	0.001	-	IEC 60250
Dissipation Factor, 1 MHz	0.007	-	IEC 60250
Comparative Tracking Index	175	V	IEC 60112
<b>FLAME CHARACTERISTICS</b>			

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Glow Wire Flammability Index 960°C, passes at	3.2	mm	IEC 60695-2-12
Glow Wire Ignitability Temperature, 3.0 mm	850	°C	IEC 60695-2-13
Oxygen Index (LOI)	45	%	ISO 4589
<b>INJECTION MOLDING</b>			
Drying Temperature	150	°C	
Drying Time	4 – 6	hrs	
Drying Time (Cumulative)	24	hrs	
Maximum Moisture Content	0.02	%	
Melt Temperature	380 – 405	°C	
Nozzle Temperature	375 – 400	°C	
Front - Zone 3 Temperature	380 – 405	°C	
Middle - Zone 2 Temperature	370 – 395	°C	
Rear - Zone 1 Temperature	360 – 380	°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	

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