ULTEM™ Resin VH1003M

Europe-Africa-Middle East: COMMERCIAL

Transparent, Thermoplastic Polyimide (TPI) resin. Glass transition Temp. (Tg) of 247°C. Internal mold release. This resin has thinwall FR capability and has a UL94 V0 listing. Resin is halogen free according VDE/DIN 472 part 815. 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 PROPERTIES[1]	TYPICAL VALUE	Unit	Standard
MECHANICAL			
Tensile Stress, yld, Type I, 5 mm/min	980	kgf/cm²	ASTM D 638
Tensile Stress, brk, Type I, 5 mm/min	980	kgf/cm²	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	35800	kgf/cm²	ASTM D 638
Flexural Stress, brk, 1.3 mm/min, 50 mm span	1610	kgf/cm²	ASTM D 790
Flexural Stress, yld, 2.6 mm/min, 100 mm span	1580	kgf/cm²	ASTM D 790
Flexural Modulus, 1.3 mm/min, 50 mm span	32300	kgf/cm²	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	8.4	%	ISO 527
Tensile Strain, break, 5 mm/min	50	%	ISO 527
Tensile Modulus, 1 mm/min	3120	MPa	ISO 527
Flexural Stress, break, 2 mm/min	123	MPa	ISO 178
Flexural Modulus, 2 mm/min	3070	MPa	ISO 178
Hardness, H358/30	138	MPa	ISO 2039-1
IMPACT			
Izod Impact, unnotched, 23°C	NB	cm-kgf/cm	ASTM D 4812
Izod Impact, notched, 23°C	7	cm-kgf/cm	ASTM D 256
Izod Impact, notched, -30°C	7	cm-kgf/cm	ASTM D 256
Instrumented Impact Total Energy, 23°C	345	cm-kgf	ASTM D 3763
Izod Impact, unnotched 80*10*4 +23°C	196	kJ/m²	ISO 180/1U

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(3) This rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.
(4) Internal measurements according to UL standards.
(5) 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.

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IMPACT			
Izod Impact, unnotched 80*10*4 -30°C	147	kJ/m²	ISO 180/1U
Izod Impact, notched 80*10*4 +23°C	6	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	5	kJ/m²	ISO 180/1A
Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm	NB	kJ/m²	ISO 179/1eU
Charpy -30°C, Unnotch Edgew 80*10*4 sp=62mm	NB	kJ/m²	ISO 179/1eU
THERMAL			
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	240	°C	ISO 306
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	228	°C	ISO 75/Af
PHYSICAL			
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

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TYPICAL PROPERTIES[1]	TYPICAL VALUE	Unit	Standard
PHYSICAL			
Density	1.3	g/cm³	ISO 1183
Water Absorption, (23°C/sat)	1.75	%	ISO 62
Moisture Absorption (23°C / 50% RH)	0.65	%	ISO 62
Melt Volume Rate, MVR at 360°C/5.0 kg	8	cm³/10 min	ISO 1133
ELECTRICAL			
Dielectric Strength, in oil, 3.2 mm	14	kV/mm	ASTM D 149
Relative Permittivity, 100 Hz	3.38	-	ASTM D 150
Relative Permittivity, 1 kHz	3.37	-	ASTM D 150
Dissipation Factor, 50/60 Hz	0.018	-	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
FLAME CHARACTERISTICS			
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

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PROCESSING PARAMETERS	TYPICAL VALUE	Unit
Injection Molding		
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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