

# MATERIAL DATA SHEET

# Z-ULTRAT

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## Material Data Sheet: Z-ULTRAT

Physical Properties	Metric	English	Comments
Density	1.04 g/cm <sup>3</sup>	8.679 lbs/gal	ISO 1183
Mold Shrinkage, Flow	0.5 - 0.8% Thickness 3.20 mm	0.5 - 0.8% Thickness 0.126 in	
Melt Flow	11.7 g/10 min Load 3.80 kg, Temperature 230 °C	0.0257 lb/10 min Load 8.38 lb, Temperature 446 °F	ASTM D1238
	12 g/10 min Load 5 kg, Temperature 220 °C	0.0265 lb/10 min Load 11 lb, Temperature 428 °F	ISO 1183
	42 g/10 min Load 10 kg, Temperature 220 °C	0.0926 lb/10 min Load 22 lb, Temperature 428 °F	
Melt Viscosity	1720 1000 sec <sup>-1</sup> , Temperature 240 °C	1720 1000 sec <sup>-1</sup> , Temperature 464 °T	ASTM D3825
Mechanical Properties	Metric	English	Comments
Hardness, Rockwell R	113	113	
Tensile Strength, Yield	46 MPa 5 mm/min	6600 psi 0.2 in/min	ASTM D638
	46 MPa 50 mm/min	6600 psi 1.96 in/min	ISO 527
Tensile Strength, Break	35 MPa 5 mm/min	5000 psi 0.2 in/min	ASTM D638
	35 MPa 50 mm/min	5000 psi 1.96 in/min	ISO 527
Elongation at Yield	2 %	2 %	5 mm/min; ASTM D638
	2.3 %	2.3 %	50 mm/min; ISO 527
Elongation at Break	18 %	18 %	5 mm/min; ASTM D638
	40 %	40 %	50 mm/min; ISO 527

Tensile Modulus	2.45 GPa 1 mm/min	355 ksi 0.04 in/min	ISO 527
	2.48 GPa 5 mm/min	360 ksi 0.19 in/min	ASTM D638
Izod Impact, Notched	80 J/m Temperature -30.0 °C	1.4 ft-lb/in Temperature -22.0 °F	ASTM D256
	240 J/m Temperature 23.0 °C	4.4 ft-lb/in Temperature 73.0 °F	
	7 kJ/m <sup>2</sup> 80x10x4 mm, Temp -30.0 °C	3.33 ft-lb/in <sup>2</sup> 3.15x0.394x0.157 in, Temperature -22.0 °F	ISO 180/1A
	16 kJ/m <sup>2</sup> 80x10x4 mm, Temp 23.0 °C	7.61 ft-lb/in <sup>2</sup> 3.15x0.394x0.157 in, Temperature 73.0 °F	
Charpy Impact, V-notch	18 kJ/m <sup>2</sup> 80x10x4 mm, Span 62 mm	8.57 ft-lb/in <sup>2</sup> 3.15x0.394x0.157 in, Span 2.44 in	ISO 179/1eA
Flexural Strength, Yield	79 MPa 1.3 mm/min, 50 mm span	11458 psi 0.05 in/min, 2 in span	ASTM D790
	70 MPa 2 mm/min	10153 psi 0.079 in/min	ISO 178
Flexural Modulus	2.62 GPa 1.3 mm/min, 50 mm span	380 ksi 0.05 in/min, 2 in span	ASTM D790
	2.5 GPa 2 mm/min	363 ksi 0.079 in/min	ISO 178
Instrumented Impact Total Energy	5 J Temperature -30.0 °C	44 in-lb Temperature -22.0 °F	ASTM D3763
	21 J Temperature 23.0 °C	185 in-lb Temperature 73.0 °F	ASTM D3763
Thermal Properties	Metric	English	Comments
Vicat Softening Point	98.0 °C	208.4 °F	Rate B/50; ASTM D 1525
	98.0 °C	208.4 °F	Rate B/50; ISO 306
	100.0 °C	212.0 °F	Rate B/120; ISO 306
Flame Class Rating	HB Thickness 1.52 mm	HB Thickness 0.0598 in	UL94

Coefficient of Thermal Expansion	8.82E-05 1/°C -40.0 °C to 40.0 °C	4.9E-05 1/°F -40.0 °F to 104 °F	ASTM E 831; flow
	8.46E-05 1/°C -40.0 °C to 40.0 °C	4.7E-05 1/°F -40.0 °F to 104 °F	ASTM E 831; xflow
	8.82E-05 1/°C -40.0 °C to 40.0 °C	4.9E-05 1/°F -40.0 °F to 104 °F	ISO 11359-2; flow
	8.46E-05 1/°C -40.0 °C to 40.0 °C	4.7E-05 1/°F -40.0 °F to 104 °F	ISO 11359-2; xflow
Deflection Temperature at 0.45 MPa (66 psi)	95 °C Thickness 3.20 mm	203.0 °F Thickness 0.126 in	Unannealed; ASTM D648
Deflection Temperature at 1.82 MPa (264 psi)	82 °C Thickness 3.20 mm	179.6 °F Thickness 0.126 in	Unannealed; ASTM D648
Deflection Temperature at 0.45 MPa (66 psi)	89 °C 120x10x4 mm sp=100 mm	192.2 °F 4.72x0.394x0.157 in sp=3,937 in	ISO 75/Be
Deflection Temperature at 1.8 MPa (264 psi)	76 °C 120x10x4 mm sp=100 mm	168.8 °F 4.72x0.394x0.157 in sp=3,937 in	ISO 75/Ae
Relative Temperature Index, Electrical	60 °C	140 °F	UL 746B
Relative Temperature Index, Mechanical with Impact	60 °C	140 °F	UL 746B
Relative Temperature Index, Mechanical without Impact	60 °C	140 °F	UL 746B

The data presented in this document are intended for information and comparison purposes only. They should not be used for project specifications or its quality evaluation. The material's actual properties depend on the printing process conditions, the design structure and its purpose, test conditions, etc.

Samples of Z-ULTRAT used to carry out the tests were made through plastic moulding.

Product specifications are subject to change without notice.

Each user is responsible for complying with product safety standards, its intended use as well as the law and waste disposal (and recycling) rules for electrical and electronic equipment. Zortrax does not make any express or implied warranties, including but not limited to implied warranties of merchantability or fitness for a particular purpose.

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