VALOX™ RESIN 4031

REGION EUROPE

DESCRIPTION

VALOX 4031 is a 30% high strength glass fibre reinforced PBT injection moulding resin with excellent strength, stiffness and heat resistance. Applications: appliance handles, spotlights, electric motors.

TYPICAL PROPERTY VALUES

Revision 20190925

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL			
Tensile Stress, yld, Type I, 5 mm/min	140	MPa	ASTM D 638
Tensile Stress, brk, Type I, 5 mm/min	140	MPa	ASTM D 638
Tensile Strain, yld, Type I, 5 mm/min	3	%	ASTM D 638
Tensile Strain, brk, Type I, 5 mm/min	3	%	ASTM D 638
Tensile Modulus, 5 mm/min	10000	MPa	ASTM D 638
Flexural Stress, yld, 1.3 mm/min, 50 mm span	190	MPa	ASTM D 790
Flexural Stress, brk, 1.3 mm/min, 50 mm span	190	MPa	ASTM D 790
Flexural Modulus, 1.3 mm/min, 50 mm span	7900	MPa	ASTM D 790
Tensile Stress, yield, 5 mm/min	135	MPa	ISO 527
Tensile Stress, break, 5 mm/min	135	MPa	ISO 527
Tensile Strain, yield, 5 mm/min	2	%	ISO 527
Tensile Strain, break, 5 mm/min	2	%	ISO 527
Tensile Modulus, 1 mm/min	10000	MPa	ISO 527
Flexural Stress, yield, 2 mm/min	210	MPa	ISO 178
Flexural Stress, break, 2 mm/min	200	MPa	ISO 178
Flexural Strain, break, 2 mm/min	3	%	ISO 178
Flexural Modulus, 2 mm/min	8300	MPa	ISO 178
Ball Indentation Hardness, H358/30	125	MPa	ISO 2039-1
Hardness, Rockwell R	125	-	ISO 2039-2
IMPACT			
Charpy Impact, unnotched, 23°C	65	kJ/m²	ISO 179/2C
Charpy Impact, unnotched, -30°C	60	kJ/m²	ISO 179/2C
Izod Impact, unnotched, 23°C	880	J/m	ASTM D 4812
Izod Impact, unnotched, -30°C	880	J/m	ASTM D 4812
Izod Impact, notched, 23°C	100	J/m	ASTM D 256
Izod Impact, notched, 0°C	100	J/m	ASTM D 256
Izod Impact, notched, -30°C	100	J/m	ASTM D 256
Izod Impact, unnotched 80*10*4 +23°C	55	kJ/m²	ISO 180/1U
Izod Impact, unnotched 80*10*4 -30°C	55	kJ/m²	ISO 180/1U
Izod Impact, notched 80*10*4 +23°C	11	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 0°C	11	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	10	kJ/m²	ISO 180/1A
Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm	7	kJ/m²	ISO 179/1eA
Charpy Impact, notched, 23°C	12	kJ/m²	ISO 179/2C

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PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Charpy -30°C, V-notch Edgew 80*10*4 sp=62mm	6	kJ/m²	ISO 179/1eA
Charpy Impact, notched, -30°C	12	kJ/m²	ISO 179/2C
Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm	50	kJ/m²	ISO 179/1eU
Charpy -30°C, Unnotch Edgew 80*10*4 sp=62mm	55	kJ/m²	ISO 179/1eU
THERMAL			
Vicat Softening Temp, Rate A/50	220	°C	ASTM D 1525
Vicat Softening Temp, Rate B/50	215	°C	ASTM D 1525
HDT, 0.45 MPa, 3.2 mm, unannealed	220	°C	ASTM D 648
HDT, 1.82 MPa, 3.2mm, unannealed	205	°C	ASTM D 648
CTE, -40°C to 40°C, flow	2.1E-05	1/°C	ISO 11359-2
CTE, -40°C to 40°C, xflow	7.4E-05	1/°C	ISO 11359-2
CTE, 23°C to 80°C, flow	3.E-05	1/°C	ISO 11359-2
CTE, 23°C to 80°C, xflow	1.2E-04	1/°C	ISO 11359-2
CTE, 23°C to 150°C, flow	1.98E-05	1/°C	ISO 11359-2
CTE, 23°C to 150°C, xflow	1.73E-04	1/°C	ISO 11359-2
Ball Pressure Test, 125°C +/- 2°C	PASSES	-	IEC 60695-10-2
Vicat Softening Temp, Rate A/50	220	°C	ISO 306
Vicat Softening Temp, Rate B/50	215	°C	ISO 306
Vicat Softening Temp, Rate B/120	215	°C	ISO 306
HDT/Be, 0.45MPa Edgew 120*10*4 sp=100mm	220	°C	ISO 75/Be
HDT/Ae, 1.8 MPa Edgew 120*10*4 sp=100mm	210	°C	ISO 75/Ae
HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm	220	°C	ISO 75/Bf
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	205	°C	ISO 75/Af
Relative Temp Index, Elec	140	°C	UL 746B
Relative Temp Index, Mech w/impact	140	°C	UL 746B
Relative Temp Index, Mech w/o impact	140	°C	UL 746B
PHYSICAL			
Specific Gravity	1.54	-	ASTM D 792
Filler Content	30	%	ASTM D 229
Mold Shrinkage on Tensile Bar, flow	0.3 – 0.7	%	SABIC method
Mold Shrinkage on Tensile Bar, xflow	0.5 – 1	%	SABIC method
Melt Flow Rate, 266°C/5.0 kgf	50	g/10 min	ASTM D 1238
Density	1.54	g/cm³	ISO 1183
Water Absorption, (23°C/sat)	0.26	%	ISO 62
Moisture Absorption (23°C / 50% RH)	0.06	%	ISO 62
Melt Volume Rate, MVR at 250°C/2.16 kg	12	cm³/10 min	ISO 1133
Melt Volume Rate, MVR at 250°C/5.0 kg	30	cm³/10 min	ISO 1133
Melt Volume Rate, MVR at 265°C/5.0 kg	40	cm³/10 min	ISO 1133
Melt Viscosity, 260°C, 1500 sec-1	150	Pa-s	ISO 11443
ELECTRICAL			
Volume Resistivity	>1.E+15	Ohm-cm	ASTM D 257
Dielectric Strength, in oil, 0.8 mm	26	kV/mm	ASTM D 149
Dielectric Strength, in oil, 1.6 mm	24	kV/mm	ASTM D 149
Dielectric Strength, in oil, 3.2 mm	18	kV/mm	ASTM D 149
Arc Resistance, Tungsten {PLC}	5	PLC Code	ASTM D 495

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PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Hot Wire Ignition {PLC}	1	PLC Code	UL 746A
High Voltage Arc Track Rate {PLC}	1	PLC Code	UL 746A
High Ampere Arc Ign, surface {PLC}	1	PLC Code	UL 746A
Comparative Tracking Index (UL) {PLC}	0	PLC Code	UL 746A
Volume Resistivity	>1.E+15	Ohm-cm	IEC 60093
Surface Resistivity, ROA	>1.E+15	Ohm	IEC 60093
Dielectric Strength, in oil, 0.8 mm	26	kV/mm	IEC 60243-1
Dielectric Strength, in oil, 1.6 mm	24	kV/mm	IEC 60243-1
Dielectric Strength, in oil, 3.2 mm	15	kV/mm	IEC 60243-1
Relative Permittivity, 1 MHz	3.1	-	IEC 60250
Dissipation Factor, 50/60 Hz	0.0016	-	IEC 60250
Dissipation Factor, 1 MHz	0.014	-	IEC 60250
Comparative Tracking Index	250	V	IEC 60112
Relative Permittivity, 50/60 Hz	3.3	-	IEC 60250
FLAME CHARACTERISTICS			
UL Yellow Card Link	E45329-236594	-	-
UL Recognized, 94HB Flame Class Rating	0.84	mm	UL 94
UL Recognized, 94HB Flame Class Rating 2nd value	6	mm	UL 94
Glow Wire Flammability Index 750°C, passes at	1	mm	IEC 60695-2-12
INJECTION MOLDING			
Drying Temperature	110 – 120	°C	
Drying Time	2 – 4	hrs	
Maximum Moisture Content	0.02	%	
Melt Temperature	250 – 270	°C	
Nozzle Temperature	240 – 260	°C	
Front - Zone 3 Temperature	245 – 265	°C	
Middle - Zone 2 Temperature	240 – 255	°C	
Rear - Zone 1 Temperature	230 – 245	°C	
Hopper Temperature	40 – 60	°C	
Mold Temperature	40 – 100	°C	

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