

# VALOX<sup>TM</sup> RESIN VX5022

REGION EUROPE

## DESCRIPTION

VALOX VX5022 is a 20% glass fibre reinforced PBT+PC blend with low warpage characteristics. This grade is 5021 with reduced warpage.

## TYPICAL PROPERTY VALUES

Revision 20190214

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
<b>MECHANICAL</b>			
Tensile Stress, yld, Type I, 5 mm/min	125	MPa	ASTM D 638
Tensile Stress, brk, Type I, 5 mm/min	125	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	7300	MPa	ASTM D 638
Flexural Stress, yld, 1.3 mm/min, 50 mm span	145	MPa	ASTM D 790
Flexural Modulus, 1.3 mm/min, 50 mm span	5800	MPa	ASTM D 790
Tensile Stress, yield, 5 mm/min	110	MPa	ISO 527
Tensile Stress, break, 5 mm/min	110	MPa	ISO 527
Tensile Strain, yield, 5 mm/min	3	%	ISO 527
Tensile Strain, break, 5 mm/min	3	%	ISO 527
Tensile Modulus, 1 mm/min	7100	MPa	ISO 527
Flexural Stress, yield, 2 mm/min	150	MPa	ISO 178
Flexural Stress, break, 2 mm/min	150	MPa	ISO 178
Flexural Strain, break, 2 mm/min	3	%	ISO 178
Flexural Modulus, 2 mm/min	6300	MPa	ISO 178
Hardness, H358/30	205	MPa	ISO 2039-1
Hardness, Rockwell R	122	-	ISO 2039-2
<b>IMPACT</b>			
Charpy Impact, unnotched, 23°C	55	kJ/m <sup>2</sup>	ISO 179/2C
Charpy Impact, unnotched, -30°C	50	kJ/m <sup>2</sup>	ISO 179/2C
Izod Impact, unnotched, 23°C	650	J/m	ASTM D 4812
Izod Impact, unnotched, -30°C	645	J/m	ASTM D 4812
Izod Impact, notched, 23°C	80	J/m	ASTM D 256
Izod Impact, notched, 0°C	80	J/m	ASTM D 256
Izod Impact, notched, -30°C	80	J/m	ASTM D 256
Instrumented Impact Total Energy, 23°C	65	J	ASTM D 3763
Izod Impact, unnotched 80*10*4 +23°C	40	kJ/m <sup>2</sup>	ISO 180/1U
Izod Impact, unnotched 80*10*4 -30°C	35	kJ/m <sup>2</sup>	ISO 180/1U
Izod Impact, notched 80*10*4 +23°C	7	kJ/m <sup>2</sup>	ISO 180/1A
Izod Impact, notched 80*10*4 0°C	7	kJ/m <sup>2</sup>	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	6	kJ/m <sup>2</sup>	ISO 180/1A
Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm	6	kJ/m <sup>2</sup>	ISO 179/1eA
Charpy Impact, notched, 23°C	9	kJ/m <sup>2</sup>	ISO 179/2C
Charpy -30°C, V-notch Edgew 80*10*4 sp=62mm	5	kJ/m <sup>2</sup>	ISO 179/1eA

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Charpy Impact, notched, -30°C	9	kJ/m <sup>2</sup>	ISO 179/2C
Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm	40	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy -30°C, Unnotch Edgew 80*10*4 sp=62mm	40	kJ/m <sup>2</sup>	ISO 179/1eU
<b>THERMAL</b>			
Vicat Softening Temp, Rate A/50	200	°C	ASTM D 1525
Vicat Softening Temp, Rate B/50	145	°C	ASTM D 1525
HDT, 0.45 MPa, 3.2 mm, unannealed	180	°C	ASTM D 648
HDT, 1.82 MPa, 3.2mm, unannealed	120	°C	ASTM D 648
CTE, -40°C to 40°C, flow	4.E-05	1/°C	ASTM E 831
CTE, -40°C to 40°C, xflow	1.E-04	1/°C	ASTM E 831
CTE, -40°C to 40°C, flow	2.49E-05	1/°C	ISO 11359-2
CTE, -40°C to 40°C, xflow	6.87E-05	1/°C	ISO 11359-2
CTE, 23°C to 60°C, flow	4.E-05	1/°C	ISO 11359-2
CTE, 23°C to 60°C, xflow	1.E-04	1/°C	ISO 11359-2
CTE, 23°C to 80°C, flow	4.E-05	1/°C	ISO 11359-2
CTE, 23°C to 80°C, xflow	1.E-04	1/°C	ISO 11359-2
CTE, 23°C to 150°C, flow	2.43E-05	1/°C	ISO 11359-2
CTE, 23°C to 150°C, xflow	1.12E-04	1/°C	ISO 11359-2
Ball Pressure Test, 125°C +/- 2°C	PASSES	-	IEC 60695-10-2
Vicat Softening Temp, Rate A/50	200	°C	ISO 306
Vicat Softening Temp, Rate B/50	145	°C	ISO 306
Vicat Softening Temp, Rate B/120	145	°C	ISO 306
HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm	180	°C	ISO 75/Bf
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	120	°C	ISO 75/Af
<b>PHYSICAL</b>			
Specific Gravity	1.39	-	ASTM D 792
Filler Content	20	%	ASTM D 229
Mold Shrinkage on Tensile Bar, flow	0.3 – 0.8	%	SABIC method
Mold Shrinkage, flow, 3.2 mm	0.3 – 0.5	%	SABIC method
Mold Shrinkage on Tensile Bar, xflow	0.5 – 0.9	%	SABIC method
Melt Flow Rate, 250°C/2.16 kgf	16	g/10 min	ASTM D 1238
Melt Flow Rate, 265°C/5.0 kgf	50	g/10 min	ASTM D 1238
Melt Flow Rate, 266°C/5.0 kgf	50	g/10 min	ASTM D 1238
Density	1.39	g/cm <sup>3</sup>	ISO 1183
Water Absorption, (23°C/sat)	0.1	%	ISO 62
Moisture Absorption (23°C / 50% RH)	0.06	%	ISO 62
Melt Volume Rate, MVR at 250°C/2.16 kg	13	cm <sup>3</sup> /10 min	ISO 1133
Melt Volume Rate, MVR at 250°C/5.0 kg	28	cm <sup>3</sup> /10 min	ISO 1133
Melt Volume Rate, MVR at 265°C/5.0 kg	40	cm <sup>3</sup> /10 min	ISO 1133
Melt Viscosity, 260°C, 1500 sec-1	215	Pa-s	ISO 11443
<b>ELECTRICAL</b>			
Volume Resistivity	>1.E+15	Ohm-cm	ASTM D 257
Dielectric Strength, in oil, 0.8 mm	31	kV/mm	ASTM D 149
Dielectric Strength, in oil, 1.6 mm	28	kV/mm	ASTM D 149
Dielectric Strength, in oil, 3.2 mm	16	kV/mm	ASTM D 149

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Relative Permittivity, 1 MHz	3.3	-	ASTM D 150
Dissipation Factor, 1 MHz	0.014	-	ASTM D 150
Hot Wire Ignition {PLC}	0	PLC Code	UL 746A
High Ampere Arc Ign, surface {PLC}	0	PLC Code	UL 746A
Volume Resistivity	>1.E+16	Ohm-cm	IEC 60093
Surface Resistivity, ROA	>1.E+16	Ohm	IEC 60093
Dielectric Strength, in oil, 0.8 mm	31	kV/mm	IEC 60243-1
Dielectric Strength, in oil, 1.6 mm	28	kV/mm	IEC 60243-1
Dielectric Strength, in oil, 3.2 mm	16	kV/mm	IEC 60243-1
Relative Permittivity, 100 Hz	3.3	-	IEC 60250
Relative Permittivity, 1 MHz	3.3	-	IEC 60250
Dissipation Factor, 50/60 Hz	0.001	-	IEC 60250
Dissipation Factor, 100 Hz	0.001	-	IEC 60250
Dissipation Factor, 1 MHz	0.014	-	IEC 60250
Comparative Tracking Index	250	V	IEC 60112
Comparative Tracking Index, M	100	V	IEC 60112
Relative Permittivity, 50/60 Hz	3.1	-	IEC 60250
<b>FLAME CHARACTERISTICS</b>			
UL Recognized, 94HB Flame Class Rating	1.5	mm	UL 94
UL Recognized, 94HB Flame Class Rating 2nd value	3	mm	UL 94
Glow Wire Flammability Index 750°C, passes at	1	mm	IEC 60695-2-12
Glow Wire Flammability Index 850°C, passes at	2	mm	IEC 60695-2-12
Oxygen Index (LOI)	23	%	ISO 4589
<b>INJECTION MOLDING</b>			
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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