

VALOX™ FR RESIN ENH4560

REGION EUROPE

DESCRIPTION

VALOX ENH4560 Polybutylene Terephthalate (PBT) resin is a 30% glass fiber reinforced, injection moldable grade. This non-chlorinated, non-brominated flame retardant PBT has a UL V0 rating. VALOX ENH4560 resin is a general purpose resin that is an excellent candidate for a wide variety of applications.

TYPICAL PROPERTY VALUES

Revision 20180528

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL			
Tensile Stress, yld, Type I, 5 mm/min	105	MPa	ASTM D 638
Tensile Stress, brk, Type I, 5 mm/min	105	MPa	ASTM D 638
Tensile Strain, yld, Type I, 5 mm/min	2	%	ASTM D 638
Tensile Strain, brk, Type I, 5 mm/min	2	%	ASTM D 638
Tensile Modulus, 5 mm/min	11000	MPa	ASTM D 638
Flexural Stress, yld, 1.3 mm/min, 50 mm span	160	MPa	ASTM D 790
Flexural Stress, brk, 1.3 mm/min, 50 mm span	160	MPa	ASTM D 790
Flexural Modulus, 1.3 mm/min, 50 mm span	9300	MPa	ASTM D 790
Tensile Stress, yield, 5 mm/min	108	MPa	ISO 527
Tensile Stress, break, 5 mm/min	108	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	11000	MPa	ISO 527
Flexural Stress, yield, 2 mm/min	175	MPa	ISO 178
Flexural Stress, break, 2 mm/min	175	MPa	ISO 178
Flexural Strain, break, 2 mm/min	2	%	ISO 178
Flexural Modulus, 2 mm/min	10000	MPa	ISO 178
Hardness, H358/30	142	MPa	ISO 2039-1
Hardness, Rockwell R	120	-	ISO 2039-2
IMPACT			
Charpy Impact, unnotched, 23°C	40	kJ/m ²	ISO 179/2C
Charpy Impact, unnotched, -30°C	35	kJ/m ²	ISO 179/2C
Izod Impact, unnotched, 23°C	570	J/m	ASTM D 4812
Izod Impact, unnotched, -30°C	500	J/m	ASTM D 4812
Izod Impact, notched, 23°C	72	J/m	ASTM D 256
Izod Impact, notched, 0°C	72	J/m	ASTM D 256

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Izod Impact, notched, -30°C	65	J/m	ASTM D 256
Izod Impact, unnotched 80*10*4 +23°C	37	kJ/m ²	ISO 180/1U
Izod Impact, unnotched 80*10*4 -30°C	37	kJ/m ²	ISO 180/1U
Izod Impact, notched 80*10*4 +23°C	8	kJ/m ²	ISO 180/1A
Izod Impact, notched 80*10*4 0°C	9	kJ/m ²	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	8	kJ/m ²	ISO 180/1A
Charpy Impact, notched, 23°C	10	kJ/m ²	ISO 179/2C
Charpy Impact, notched, -30°C	10	kJ/m ²	ISO 179/2C
THERMAL			
Vicat Softening Temp, Rate A/50	217	°C	ASTM D 1525
Vicat Softening Temp, Rate B/50	200	°C	ASTM D 1525
HDT, 0.45 MPa, 3.2 mm, unannealed	223	°C	ASTM D 648
HDT, 1.82 MPa, 3.2mm, unannealed	205	°C	ASTM D 648
CTE, -40°C to 40°C, flow	2.E-05	1/°C	ISO 11359-2
CTE, -40°C to 40°C, xflow	6.2E-05	1/°C	ISO 11359-2
CTE, 23°C to 150°C, flow	2.5E-05	1/°C	ISO 11359-2
CTE, 23°C to 150°C, xflow	1.5E-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	200	°C	ISO 306
Vicat Softening Temp, Rate B/120	205	°C	ISO 306
HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm	225	°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	125	°C	UL 746B
Relative Temp Index, Mech w/o impact	140	°C	UL 746B
PHYSICAL			
Specific Gravity	1.56	-	ASTM D 792
Mold Shrinkage, flow, 3.2 mm (5)	0.28	%	SABIC method
Mold Shrinkage, xflow, 3.2 mm (5)	0.57	%	SABIC method
Filler Content	30	%	ASTM D 229
Melt Flow Rate, 265°C/5.0 kgf	23	g/10 min	ASTM D 1238
Density	1.56	g/cm ³	ISO 1183
Water Absorption, (23°C/sat)	0.23	%	ISO 62
Moisture Absorption (23°C / 50% RH)	0.09	%	ISO 62
Melt Volume Rate, MVR at 250°C/5.0 kg	16	cm ³ /10 min	ISO 1133
Melt Viscosity, 260°C, 1500 sec-1	110	Pa-s	ISO 11443
ELECTRICAL			

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Volume Resistivity	1.0E+14	Ohm-cm	ASTM D 257
Dielectric Strength, in oil, 0.8 mm	32	kV/mm	ASTM D 149
Dielectric Strength, in oil, 1.6 mm	22	kV/mm	ASTM D 149
Dielectric Strength, in oil, 3.2 mm	18	kV/mm	ASTM D 149
Relative Permittivity, 1 MHz	3.8	-	ASTM D 150
Dissipation Factor, 1 MHz	0.14	-	ASTM D 150
Hot Wire Ignition {PLC}	0	PLC Code	UL 746A
High Ampere Arc Ign, surface {PLC}	0	PLC Code	UL 746A
Comparative Tracking Index (UL) {PLC}	0	PLC Code	UL 746A
Volume Resistivity	1.E+14	Ohm-cm	IEC 60093
Surface Resistivity, ROA	>1.E+15	Ohm	IEC 60093
Dielectric Strength, in oil, 0.8 mm	32	kV/mm	IEC 60243-1
Dielectric Strength, in oil, 1.6 mm	22	kV/mm	IEC 60243-1
Dielectric Strength, in oil, 3.2 mm	18	kV/mm	IEC 60243-1
Relative Permittivity, 1 MHz	3.8	-	IEC 60250
Dissipation Factor, 1 MHz	0.14	-	IEC 60250
Comparative Tracking Index	600	V	IEC 60112
FLAME CHARACTERISTICS			
UL Recognized, 94V-0 Flame Class Rating (3)	0.8	mm	UL 94
UL Recognized, 94-5VB Rating (3)	3	mm	UL 94
Glow Wire Flammability Index 960°C, passes at	0.8	mm	IEC 60695-2-12
Glow Wire Ignitability Temperature, 1.0 mm	750	°C	IEC 60695-2-13
Glow Wire Ignitability Temperature, 2.0 mm	750	°C	IEC 60695-2-13
Glow Wire Ignitability Temperature, 3.0 mm	800	°C	IEC 60695-2-13
INJECTION MOLDING			
Drying Temperature	110 – 120	°C	
Drying Time	2 – 4	hrs	
Maximum Moisture Content	0.02	%	
Melt Temperature	245 – 260	°C	
Nozzle Temperature	230 – 255	°C	
Front - Zone 3 Temperature	240 – 260	°C	
Middle - Zone 2 Temperature	235 – 250	°C	
Rear - Zone 1 Temperature	230 – 240	°C	
Hopper Temperature	40 – 60	°C	
Mold Temperature	40 – 100	°C	



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