VALOX™ FR RESIN ENH4550

REGION EUROPE

DESCRIPTION

VALOX ENH4550 is a 25% glass reinforced, non-chlorinated/brominated flame retardant Polybutylene Terephthalate (PBT) injection moldable grade with excellent chemical resistance. It has a UL94V0@0.30mm and 5VA@2.0mm flame rating. This is a good candidate for a variety of applications needing a sustainable FR PBT solution.

TYPICAL PROPERTY VALUES

Revision 20260722

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL [1]			
Tensile Stress, yld, Type I, 5 mm/min	115	MPa	ASTM D638
Tensile Stress, brk, Type I, 5 mm/min	115	MPa	ASTM D638
Tensile Strain, yld, Type I, 5 mm/min	2	%	ASTM D638
Tensile Strain, brk, Type I, 5 mm/min	2	%	ASTM D638
Tensile Modulus, 5 mm/min	10300	MPa	ASTM D638
Flexural Stress, yld, 1.3 mm/min, 50 mm span	165	MPa	ASTM D790
Flexural Stress, brk, 1.3 mm/min, 50 mm span	165	MPa	ASTM D790
Flexural Modulus, 1.3 mm/min, 50 mm span	8800	MPa	ASTM D790
Tensile Stress, yield, 5 mm/min	112	MPa	ISO 527
Tensile Stress, break, 5 mm/min	112	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	10400	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	9200	MPa	ISO 178
Ball Indentation Hardness, H358/30	174	MPa	ISO 2039-1
Hardness, Rockwell R	124	-	ISO 2039-2
IMPACT [1]			
Izod Impact, unnotched, 23°C	550	J/m	ASTM D4812
Izod Impact, unnotched, -30°C	525	J/m	ASTM D4812
Izod Impact, notched, 23°C	70	J/m	ASTM D256
Izod Impact, notched, 0°C	70	J/m	ASTM D256
Izod Impact, notched, -30°C	65	J/m	ASTM D256
Instrumented Dart Impact Total Energy, 23°C	6	J	ASTM D3763
Izod Impact, unnotched 80*10*4 +23°C	40	kJ/m²	ISO 180/1U
Izod Impact, unnotched 80*10*4 -30°C	35	kJ/m²	ISO 180/1U
Izod Impact, notched 80*10*4 +23°C	8	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 0°C	8	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	8	kJ/m²	ISO 180/1A
Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm	5	kJ/m²	ISO 179/1eA
Charpy Impact, notched, 23°C	8	kJ/m²	ISO 179/2C
Charpy Impact, notched, -30°C	8	kJ/m²	ISO 179/2C

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Charpy Impact, unnotched, -30°C	40	kJ/m²	ISO 179/2C
Charpy Impact, unnotched, 23°C	45	kJ/m²	ISO 179/2C
THERMAL [1]			
Vicat Softening Temp, Rate A/50	215	°C	ASTM D1525
Vicat Softening Temp, Rate B/50	205	°C	ASTM D1525
HDT, 0.45 MPa, 3.2 mm, unannealed	220	°C	ASTM D648
HDT, 1.82 MPa, 3.2mm, unannealed	205	°C	ASTM D648
CTE, -40°C to 40°C, flow	2.43E-05	1/°C	ASTM E831
CTE, -40°C to 40°C, xflow	6.3E-05	1/°C	ASTM E831
CTE, -40°C to 40°C, flow	2.8E-05	1/°C	ISO 11359-2
CTE, -40°C to 40°C, xflow	7.1E-05	1/°C	ISO 11359-2
CTE, 23°C to 80°C, flow	2.2E-05	1/°C	ISO 11359-2
CTE, 23°C to 80°C, xflow	9.1E-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	1.48E-04	1/°C	ISO 11359-2
Ball Pressure Test, 125°C +/- 2°C	Pass	-	IEC 60695-10-2
Vicat Softening Temp, Rate A/50	220	°C	ISO 306
Vicat Softening Temp, Rate B/50	207	°C	ISO 306
Vicat Softening Temp, Rate B/120	208	°C	ISO 306
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	207	°C	ISO 75/Af
Relative Temp Index, Elec [2]	130	°C	UL 746B
Relative Temp Index, Mech w/impact [2]	140	°C	UL 746B
Relative Temp Index, Mech w/o impact [2]	140	°C	UL 746B
PHYSICAL [1]			
Specific Gravity	1.52	-	ASTM D792
Filler Content	25	%	ASTM D229
Mold Shrinkage on Tensile Bar, flow [3]	0.1 – 0.5	%	SABIC method
Mold Shrinkage, flow, 3.2 mm [3]	0.1 – 0.5	%	SABIC method
Mold Shrinkage on Tensile Bar, xflow [3]	0.6 – 1.2	%	SABIC method
Mold Shrinkage, xflow, 3.2 mm [3]	0.5 – 1.1	%	SABIC method
Melt Flow Rate, 250°C/5.0 kgf	25	g/10 min	ASTM D1238
Melt Flow Rate, 265°C/5.0 kgf	27	g/10 min	ASTM D1238
Density	1.52	g/cm³	ISO 1183
Water Absorption, (23°C/saturated)	0.23	%	ISO 62-1
Moisture Absorption (23°C / 50% RH)	0.06	%	ISO 62
Melt Volume Rate, MVR at 250°C/5.0 kg	18	cm³/10 min	ISO 1133
Melt Volume Rate, MVR at 265°C/5.0 kg	18	cm³/10 min	ISO 1133
Melt Viscosity, 250°C, 1500 sec-1	210	Pa-s	ISO 11443
Melt Viscosity, 260°C, 1500 sec-1	160	Pa-s	ISO 11443
ELECTRICAL [1]			
Volume Resistivity	1.E+15	Ω.cm	ASTM D257
Dielectric Strength, in air, 3.2 mm	21	kV/mm	ASTM D149
Dielectric Strength, in oil, 0.8 mm	30	kV/mm	ASTM D149
Dielectric Strength, in oil, 1.6 mm	24	kV/mm	ASTM D149

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Dielectric Strength, in oil, 3.2 mm	20	kV/mm	ASTM D149
Relative Permittivity, 1 MHz	3.4	-	ASTM D150
Dissipation Factor, 1 MHz	0.12	-	ASTM D150
Volume Resistivity	1.E+15	Ω.cm	IEC 60093
Surface Resistivity, ROA	>1.E+15	Ω	IEC 60093
Dielectric Strength, in oil, 0.8 mm	30	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	19	kV/mm	IEC 60243-1
Relative Permittivity, 1 MHz	3.4	-	IEC 60250
Dissipation Factor, 1 MHz	0.12	-	IEC 60250
Comparative Tracking Index [4]	300	V	IEC 60112
Comparative Tracking Index (UL) {PLC}	2	PLC Code	UL 746A
Hot-Wire Ignition (HWI), PLC 0	≥0.75	mm	UL 746A
Hot-Wire Ignition (HWI), PLC 3	≥0.4	mm	UL 746A
High Amp Arc Ignition (HAI), PLC 0	≥0.4	mm	UL 746A
High Voltage Arc Track Rate {PLC}	0	PLC Code	UL 746A
Arc Resistance, Tungsten {PLC}	6	PLC Code	ASTM D495
FLAME CHARACTERISTICS [2]			
UL Yellow Card Link	E45329-100051199	-	-
UL Yellow Card Link 2	E45329-101458636	-	-
UL Recognized, 94-5VA Flame Class Rating	≥2	mm	UL 94
UL Recognized, 94V-0 Flame Class Rating	≥0.3	mm	UL 94
Glow Wire Ignitability Temperature, 3.0 mm	775	°C	IEC 60695-2-13
Glow Wire Ignitability Temperature, 1.5 mm	750	°C	IEC 60695-2-13
Glow Wire Ignitability Temperature, 1.0 mm	775	°C	IEC 60695-2-13
Glow Wire Ignitability Temperature, 0.8 mm	775	°C	IEC 60695-2-13
Glow Wire Ignitability Temperature, 0.75 mm	775	°C	IEC 60695-2-13
Glow Wire Ignitability Temperature, 0.4 mm	775	°C	IEC 60695-2-13
Glow Wire Flammability Index			
3.0 mm	960	°C	IEC 60695-2-12
1.5 mm	960	°C	IEC 60695-2-12
1.0 mm	960	°C	IEC 60695-2-12
0.75 mm	960	°C	IEC 60695-2-12
0.4 mm	960	°C	IEC 60695-2-12
UV-light, water exposure/immersion	F1	-	UL 746C
Glow Wire Ignitability Temperature, 3.0 mm, by VDE	775	°C	IEC 60695-2-13
Oxygen Index (LOI)	34	%	ASTM D2863
INJECTION MOLDING [5]			
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	

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PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Rear - Zone 1 Temperature	230 – 240	°C	
Hopper Temperature	40 – 60	°C	
Mold Temperature	40 – 100	°C	

(1) The information stated on Technical Datasheets should be used as indicative only for material selection purposes and not be utilized as specification or used for part or tool design.
(2) UL Ratings shown on the technical datasheet might not cover the full range of thicknesses and colors. For details, please see the UL Yellow Card.
(3) 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.,The information stated on Technical Datasheets should be used as indicative only for material selection purposes and not be utilized as specification or used for part or tool design.
(4) Value shown here is based on internal measurement.
(5) Injection Molding parameters are only mentioned as general guidelines. These may not apply or may need adjustment in specific situations such as low shot sizes, large part molding, thin wall molding and gas-assist molding.

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