

## Valox\* Resin ENH4550

### Americas: COMMERCIAL

25% GF reinforced, Non-Brominated & Non-Chlorinated Flame Retardant, PBT resin.

TYPICAL PROPERTIES <sup>1</sup>	TYPICAL VALUE	Unit	Standard
<b>MECHANICAL</b>			
Tensile Stress, yld, Type I, 5 mm/min	1070	kgf/cm <sup>2</sup>	ASTM D 638
Tensile Stress, brk, Type I, 5 mm/min	1070	kgf/cm <sup>2</sup>	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	100900	kgf/cm <sup>2</sup>	ASTM D 638
Flexural Stress, yld, 1.3 mm/min, 50 mm span	1640	kgf/cm <sup>2</sup>	ASTM D 790
Flexural Modulus, 1.3 mm/min, 50 mm span	92700	kgf/cm <sup>2</sup>	ASTM D 790
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	10350	MPa	ISO 527
Flexural Stress, yield, 2 mm/min	170	MPa	ISO 178
Flexural Strain, break, 2 mm/min	170	%	ISO 178
Flexural Modulus, 2 mm/min	9400	MPa	ISO 178
<b>IMPACT</b>			
Charpy Impact, unnotched, 23°C	36	kJ/m <sup>2</sup>	ISO 179/2C
Charpy Impact, unnotched, -30°C	33	kJ/m <sup>2</sup>	ISO 179/2C
Izod Impact, unnotched, 23°C	52	cm-kgf/cm	ASTM D 4812
Izod Impact, unnotched, -30°C	47	cm-kgf/cm	ASTM D 4812
Izod Impact, notched, 23°C	6	cm-kgf/cm	ASTM D 256
Izod Impact, notched, -30°C	6	cm-kgf/cm	ASTM D 256

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(5) 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.

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TYPICAL PROPERTIES <sup>1</sup>	TYPICAL VALUE	Unit	Standard
<b>IMPACT</b>			
Instrumented Impact Total Energy, 23°C	66	cm-kgf	ASTM D 3763
Izod Impact, unnotched 80°10*4 +23°C	33	kJ/m <sup>2</sup>	ISO 180/1U
Izod Impact, unnotched 80°10*4 -30°C	29	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 -30°C	7	kJ/m <sup>2</sup>	ISO 180/1A
Charpy 23°C, V-notch Edgew 80°10*4 sp=62mm	5	kJ/m <sup>2</sup>	ISO 179/1eA
Charpy Impact, notched, 23°C	7	kJ/m <sup>2</sup>	ISO 179/2C
Charpy Impact, notched, -30°C	7	kJ/m <sup>2</sup>	ISO 179/2C
<b>THERMAL</b>			
Vicat Softening Temp, Rate A/50	215	°C	ASTM D 1525
Vicat Softening Temp, Rate B/50	202	°C	ASTM D 1525
HDT, 0.45 MPa, 3.2 mm, unannealed	216	°C	ASTM D 648
HDT, 1.82 MPa, 3.2mm, unannealed	204	°C	ASTM D 648
CTE, -40°C to 40°C, flow	2.7E-05	1/°C	ASTM E 831
CTE, -40°C to 40°C, xflow	7.1E-05	1/°C	ASTM E 831
CTE, -40°C to 150°C, flow	2.2E-05	1/°C	ASTM E 831
CTE, -40°C to 150°C, xflow	7.7E-05	1/°C	ASTM E 831
CTE, -40°C to 40°C, flow	3.E-05	1/°C	ISO 11359-2
CTE, -40°C to 40°C, xflow	7.6E-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
Ball Pressure Test, 125°C +/- 2°C	Pass	-	IEC 60695-10-2
Vicat Softening Temp, Rate A/50	219	°C	ISO 306
Vicat Softening Temp, Rate B/50	206	°C	ISO 306

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<b>THERMAL</b>			
Vicat Softening Temp, Rate B/120	206	°C	ISO 306
HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm	219	°C	ISO 75/Bf
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	201	°C	ISO 75/Af
Relative Temp Index, Elec	130	°C	UL 746B
Relative Temp Index, Mech w/impact	140	°C	UL 746B
Relative Temp Index, Mech w/o impact	140	°C	UL 746B
<b>PHYSICAL</b>			
Specific Gravity	1.52	-	ASTM D 792
Mold Shrinkage on Tensile Bar, flow (2)	0.1 - 0.5	%	SABIC Method
Mold Shrinkage, flow, 3.2 mm	0.1 - 0.5	%	SABIC Method
Mold Shrinkage on Tensile Bar, xflow (2)	0.6 - 1.2	%	SABIC Method
Mold Shrinkage, xflow, 3.2 mm	0.5 - 1.1	%	SABIC Method
Melt Flow Rate, 250°C/5.0 kgf	27	g/10 min	ASTM D 1238
Density	1.52	g/cm <sup>3</sup>	ISO 1183
Water Absorption, (23°C/sat)	0.23	%	ISO 62
Moisture Absorption (23°C / 50% RH)	0.06	%	ISO 62
Melt Volume Rate, MVR at 250°C/5.0 kg	20	cm <sup>3</sup> /10 min	ISO 1133
Melt Viscosity, 250°C, 1500 sec-1	210	Pa-s	ISO 11443
<b>ELECTRICAL</b>			
Volume Resistivity	1.E+15 - 1.E+16	Ohm-cm	ASTM D 257
Dielectric Strength, in air, 3.2 mm	21	kV/mm	ASTM D 149
Dielectric Strength, in oil, 3.2 mm	21	kV/mm	ASTM D 149
Arc Resistance, Tungsten {PLC}	6	PLC Code	ASTM D 495
Hot Wire Ignition {PLC}	0	PLC Code	UL 746A
High Voltage Arc Track Rate {PLC}	0	PLC Code	UL 746A
High Ampere Arc Ign, surface {PLC}	0	PLC Code	UL 746A
Comparative Tracking Index (UL) {PLC}	2	PLC Code	UL 746A
Volume Resistivity	1.E+15 - 1.E+16	Ohm-cm	IEC 60093

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<b>ELECTRICAL</b>			
Comparative Tracking Index	300	V	IEC 60112
<b>FLAME CHARACTERISTICS</b>			
UL Recognized, 94V-0 Flame Class Rating (3)	0.75	mm	UL 94
UL Recognized, 94-5VA Rating (3)	3	mm	UL 94
Glow Wire Flammability Index 960°C, passes at	0.75	mm	IEC 60695-2-12
Glow Wire Ignitability Temperature, 0.8 mm	775	°C	IEC 60695-2-13
Glow Wire Ignitability Temperature, 3.0 mm, by VDE	775	°C	IEC 60695-2-13

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PROCESSING PARAMETERS	TYPICAL VALUE	Unit
<b>Injection Molding</b>		
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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