VALOX™ FR RESINS 310SE0

REGION EUROPE

DESCRIPTION

VALOX 310SE0 is an unreinforced, flame retardant Polybutylene Terephthalate (PBT) injection moldable grade with excellent chemical resistance. It has a UL94V0@0.71mm and 5VA@3.0mm flame rating. This is a good candidate for thin wall applications in the electrical industry including bobbins, keyboards, switches and appliance housings.

TYPICAL PROPERTY VALUES

Revision 20190709

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL			
Tensile Stress, yld, Type I, 50 mm/min	58	MPa	ASTM D638
Tensile Stress, brk, Type I, 50 mm/min	52	MPa	ASTM D638
Tensile Strain, yld, Type I, 50 mm/min	5	%	ASTM D638
Tensile Strain, brk, Type I, 50 mm/min	18	%	ASTM D638
Tensile Modulus, 5 mm/min	2820	MPa	ASTM D638
Flexural Stress, yld, 1.3 mm/min, 50 mm span	101	MPa	ASTM D790
Flexural Modulus, 1.3 mm/min, 50 mm span	2620	MPa	ASTM D790
Taber Abrasion, CS-17, 1 kg	19	mg/1000cy	SABIC method
Tensile Stress, yield, 50 mm/min	58	MPa	ISO 527
Tensile Stress, break, 50 mm/min	40	MPa	ISO 527
Tensile Strain, yield, 50 mm/min	5	%	ISO 527
Tensile Strain, break, 50 mm/min	18	%	ISO 527
Tensile Modulus, 1 mm/min	2800	MPa	ISO 527
Flexural Stress, yield, 2 mm/min	90	MPa	ISO 178
Flexural Modulus, 2 mm/min	2600	MPa	ISO 178
Ball Indentation Hardness, H358/30	105	MPa	ISO 2039-1
Hardness, Rockwell R	120	-	ISO 2039-2
IMPACT			
Charpy Impact, unnotched, 23°C	NB	kJ/m²	ISO 179/2C
Charpy Impact, unnotched, -30°C	NB	kJ/m²	ISO 179/2C
Izod Impact, unnotched, 23°C	NB	J/m	ASTM D4812
Izod Impact, unnotched, -30°C	NB	J/m	ASTM D4812
Izod Impact, notched, 23°C	40	J/m	ASTM D256
Izod Impact, notched, 0°C	45	J/m	ASTM D256
Izod Impact, notched, -30°C	25	J/m	ASTM D256
Instrumented Dart Impact Total Energy, 23°C	200	J	ASTM D3763
Izod Impact, unnotched 80*10*4 +23°C	NB	kJ/m²	ISO 180/1U
Izod Impact, unnotched 80*10*4 -30°C	NB	kJ/m²	ISO 180/1U
Izod Impact, notched 80*10*4 +23°C	5	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 0°C	5	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	4	kJ/m²	ISO 180/1A
Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm	8	kJ/m²	ISO 179/1eA
Charpy Impact, notched, 23°C	5	kJ/m²	ISO 179/2C
Charpy -30°C, V-notch Edgew 80*10*4 sp=62mm	4	kJ/m²	ISO 179/1eA

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Charpy Impact, notched, -30°C	5	kJ/m²	ISO 179/2C
Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm	NB	kJ/m²	ISO 179/1eU
Charpy -30°C, Unnotch Edgew 80*10*4 sp=62mm	NB	kJ/m²	ISO 179/1eU
THERMAL			
Vicat Softening Temp, Rate A/50	212	°C	ASTM D1525
Vicat Softening Temp, Rate B/50	170	°C	ASTM D1525
HDT, 0.45 MPa, 3.2 mm, unannealed	160	°C	ASTM D648
HDT, 1.82 MPa, 3.2mm, unannealed	74	°C	ASTM D648
HDT, 0.45 MPa, 6.4 mm, unannealed	162	°C	ASTM D648
HDT, 1.82 MPa, 6.4 mm, unannealed	71	°C	ASTM D648
CTE, -40°C to 40°C, flow	7.92E-05	1/°C	ASTM E831
CTE, -40°C to 40°C, xflow	7.92E-05	1/°C	ASTM E831
CTE, 60°C to 138°C, flow	1.31E-04	1/°C	ASTM E831
Thermal Conductivity	0.24	W/m·°C	ISO 8302
CTE, -40°C to 40°C, flow	7.6E-05	1/°C	ISO 11359-2
CTE, -40°C to 40°C, xflow	7.3E-05	1/°C	ISO 11359-2
CTE, 23°C to 60°C, flow	1.E-04	1/°C	ISO 11359-2
CTE, 23°C to 60°C, xflow	1.E-04	1/°C	ISO 11359-2
Ball Pressure Test, 125°C +/- 2°C	PASSES	-	IEC 60695-10-2
Vicat Softening Temp, Rate A/50	212	°C	ISO 306
Vicat Softening Temp, Rate B/50	170	°C	ISO 306
Vicat Softening Temp, Rate B/120	170	°C	ISO 306
HDT/Be, 0.45MPa Edgew 120*10*4 sp=100mm	150	°C	ISO 75/Be
HDT/Ae, 1.8 MPa Edgew 120*10*4 sp=100mm	60	°C	ISO 75/Ae
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	73	°C	ISO 75/Af
Relative Temp Index, Elec	120	°C	UL 746B
Relative Temp Index, Mech w/impact	120	°C	UL 746B
Relative Temp Index, Mech w/o impact	140	°C	UL 746B
PHYSICAL			
Specific Gravity	1.4	-	ASTM D792
Specific Volume	0.71	cm³/g	ASTM D792
Mold Shrinkage on Tensile Bar, flow	1.1 – 1.8	%	SABIC method
Mold Shrinkage, flow, 3.2 mm	1.5 – 2.3	%	SABIC method
Mold Shrinkage, flow, 0.75-2.3 mm	0.9 – 1.6	%	SABIC method
Mold Shrinkage, flow, 2.3-4.6 mm	1.5 – 2.3	%	SABIC method
Mold Shrinkage on Tensile Bar, xflow	0.9 – 1.9	%	SABIC method
Mold Shrinkage, xflow, 0.75-2.3 mm	1 – 1.7	%	SABIC method
Mold Shrinkage, xflow, 2.3-4.6 mm	1.6 – 2.4	%	SABIC method
Melt Flow Rate, 250°C/2.16 kgf	8.6	g/10 min	ASTM D1238
Melt Flow Rate, 265°C/5.0 kgf	33	g/10 min	ASTM D1238
Melt Flow Rate, 266°C/5.0 kgf	33	g/10 min	ASTM D1238
Density	1.4	g/cm³	ISO 1183
Water Absorption, (23°C/saturated)	0.36	%	ISO 62-1
Moisture Absorption (23°C / 50% RH)	0.08	%	ISO 62
Melt Volume Rate, MVR at 250°C/2.16 kg	8	cm³/10 min	ISO 1133
Melt Volume Rate, MVR at 250°C/5.0 kg	15	cm³/10 min	ISO 1133

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Melt Volume Rate, MVR at 265°C/5.0 kg	30	cm³/10 min	ISO 1133
Melt Viscosity, 260°C, 1500 sec-1	260	Pa-s	ISO 11443
ELECTRICAL			
Volume Resistivity	>1.E+15	Ω.cm	ASTM D257
Dielectric Strength, in air, 3.2 mm	18.4	kV/mm	ASTM D149
Dielectric Strength, in oil, 1.6 mm	24	kV/mm	ASTM D149
Dielectric Strength, in oil, 3.2 mm	18	kV/mm	ASTM D149
Relative Permittivity, 1 MHz	3	-	ASTM D150
Dissipation Factor, 1 MHz	0.015	-	ASTM D150
Arc Resistance, Tungsten {PLC}	6	PLC Code	ASTM D495
Hot Wire Ignition {PLC}	2	PLC Code	UL 746A
High Voltage Arc Track Rate {PLC}	4	PLC Code	UL 746A
High Voltage Arc Resistance {PLC}	6	PLC Code	UL 746A
High Ampere Arc Ign, surface {PLC}	0	PLC Code	UL 746A
Comparative Tracking Index (UL) {PLC}	3	PLC Code	UL 746A
Volume Resistivity	>1.E+15	Ω.cm	IEC 60093
Surface Resistivity, ROA	>1.E+15	Ω	IEC 60093
Dielectric Strength, shorttime, 1.0mm	18	kV/mm	IEC 60243-1
Dielectric Strength, in oil, 0.8 mm	35	kV/mm	IEC 60243-1
Dielectric Strength, in oil, 1.6 mm	25	kV/mm	IEC 60243-1
Dielectric Strength, in oil, 3.2 mm	17	kV/mm	IEC 60243-1
Relative Permittivity, 100 Hz	3.1	-	IEC 60250
Relative Permittivity, 1 MHz	2.8	-	IEC 60250
Dissipation Factor, 50/60 Hz	0.001	-	IEC 60250
Dissipation Factor, 100 Hz	0.002	-	IEC 60250
Dissipation Factor, 1 MHz	0.0125	-	IEC 60250
Comparative Tracking Index	175	V	IEC 60112
Comparative Tracking Index, M	100	V	IEC 60112
Relative Permittivity, 50/60 Hz	2.9	-	IEC 60250
FLAME CHARACTERISTICS			
UL Yellow Card Link	E45329-236586	-	-
UL Recognized, 94V-0 Flame Class Rating	0.71	mm	UL 94
UL Recognized, 94-5VA Flame Class Rating	3	mm	UL 94
Glow Wire Flammability Index 960°C, passes at	1	mm	IEC 60695-2-12
Oxygen Index (LOI)	30	%	ISO 4589
INJECTION MOLDING			
Drying Temperature	120	°C	
Drying Time	3 – 4	Hrs	
Drying Time (Cumulative)	12	Hrs	
Maximum Moisture Content	0.02	%	
Melt Temperature	245 – 260	°C	
Nozzle Temperature	240 – 255	°C	
Front - Zone 3 Temperature	245 – 260	°C	
Middle - Zone 2 Temperature	240 – 255	°C	
Rear - Zone 1 Temperature	230 – 250	°C	

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Mold Temperature	50 – 75	°C	
Back Pressure	0.3 – 0.7	MPa	
Screw Speed	50 – 100	rpm	
Shot to Cylinder Size	40 – 80	%	
Vent Depth	0.013 – 0.025	mm	

DISCLAIMER