

VALOX™ 310SE0 resin

Polybutylene Terephthalate

SABIC Innovative Plastics

Message:

VALOX 310SE0 is an unreinforced, flame retardant PBT injection moulding resin. Applications: electrical industry, bobbins, keyboard, switches and switch components and appliance housings.

General Information			
UL YellowCard	E121562-220784		
Features	Flame Retardant		
Uses	Appliance Components		
	Bobbins		
	Electrical/Electronic Applications		
	Housings		
	Switches		
Processing Method	Injection Molding		
Multi-Point Data	Elastic Modulus vs Temperature (ASTM D4065)		
	Flexural DMA (ASTM D4065)		
	Instrumented Impact (Energy) (ASTM D3763)		
	Instrumented Impact (Load) (ASTM D3763)		
	Shear DMA (ASTM D4065)		
	Specific Heat vs. Temperature (ASTM D3417)		
	Tensile Creep (ASTM D2990)		
	Tensile Fatigue		
	Tensile Stress vs. Strain (ASTM D638)		
Physical	Nominal Value	Unit	Test Method
Specific Gravity	1.40	g/cm ³	ASTM D792, ISO 1183
Specific Volume	0.710	cm ³ /g	ASTM D792
Melt Mass-Flow Rate (MFR) (250°C/2.16 kg)	8.6	g/10 min	ASTM D1238
Melt Volume-Flow Rate (MVR) (250°C/2.16 kg)	8.00	cm ³ /10min	ISO 1133
Molding Shrinkage			Internal Method
Flow ¹	1.1 to 1.8	%	
Flow ²	1.5 to 2.3	%	
Flow ³	0.90 to 1.6	%	
Flow : 3.20 mm	1.5 to 2.3	%	
Across Flow ⁴	0.90 to 1.9	%	
Across Flow ⁵	1.0 to 1.7	%	

Across Flow ⁶	1.6 to 2.4	%	
Water Absorption			ISO 62
Saturation, 23°C	0.36	%	
Equilibrium, 23°C, 50% RH	0.080	%	
Hardness	Nominal Value	Unit	Test Method
Rockwell Hardness (R-Scale)	120		ISO 2039-2
Ball Indentation Hardness (H 358/30)	105	MPa	ISO 2039-1
Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus			
-- ⁷	2820	MPa	ASTM D638
--	2800	MPa	ISO 527-2/1
Tensile Strength			
Yield ⁸	58.0	MPa	ASTM D638
Yield	55.0	MPa	ISO 527-2/50
Break ⁹	58.0	MPa	ASTM D638
Break	40.0	MPa	ISO 527-2/50
Tensile Elongation			
Yield ¹⁰	20	%	ASTM D638
Yield	6.0	%	ISO 527-2/50
Break ¹¹	20	%	ASTM D638
Break	20	%	ISO 527-2/50
Flexural Modulus			
50.0 mm Span ¹²	2620	MPa	ASTM D790
-- ¹³	2600	MPa	ISO 178
Flexural Stress			
--	90.0	MPa	ISO 178
Yield, 50.0 mm Span ¹⁴	101	MPa	ASTM D790
Taber Abrasion Resistance (1000 Cycles, 1000 g, CS-17 Wheel)	19.0	mg	Internal Method
Impact	Nominal Value	Unit	Test Method
Charpy Notched Impact Strength			
-30°C ¹⁵	4.0	kJ/m ²	ISO 179/1eA
23°C ¹⁶	8.0	kJ/m ²	ISO 179/1eA
23°C	4.0	kJ/m ²	ISO 179/2C
Charpy Unnotched Impact Strength ¹⁷			ISO 179/1eU
-30°C	No Break		
23°C	No Break		
Notched Izod Impact			
-30°C	22	J/m	ASTM D256
23°C	37	J/m	ASTM D256
-30°C ¹⁸	3.0	kJ/m ²	ISO 180/1A
23°C ¹⁹	5.0	kJ/m ²	ISO 180/1A

Unnotched Izod Impact			
23°C	1600	J/m	ASTM D4812
-30°C ²⁰	No Break		ISO 180/1U
23°C ²¹	No Break		ISO 180/1U
Instrumented Dart Impact (23°C, Total Energy)	200	J	ASTM D3763
Thermal	Nominal Value	Unit	Test Method
Deflection Temperature Under Load			
0.45 MPa, Unannealed, 6.40 mm	162	°C	ASTM D648
0.45 MPa, Unannealed, 100 mm Span ²²	135	°C	ISO 75-2/Be
1.8 MPa, Unannealed, 3.20 mm	74.0	°C	ASTM D648
1.8 MPa, Unannealed, 6.40 mm	71.0	°C	ASTM D648
1.8 MPa, Unannealed, 100 mm Span ²³	60.0	°C	ISO 75-2/Ae
1.8 MPa, Unannealed, 64.0 mm Span ²⁴	71.0	°C	ISO 75-2/Af
Vicat Softening Temperature			
--	165	°C	ASTM D1525, ISO 306/B50, ISO 306/B120 ²⁵
--	212	°C	ISO 306/A50
Ball Pressure Test (125°C)	Pass		IEC 60695-10-2
CLTE			
Flow : -40 to 40°C	7.9E-5	cm/cm/°C	ASTM E831
Flow : 60 to 138°C	1.3E-4	cm/cm/°C	ASTM E831
Flow : -40 to 40°C	7.6E-5	cm/cm/°C	ISO 11359-2
Flow : 23 to 60°C	1.0E-4	cm/cm/°C	ISO 11359-2
Transverse : -40 to 40°C	7.9E-5	cm/cm/°C	ASTM E831
Transverse : -40 to 40°C	7.3E-5	cm/cm/°C	ISO 11359-2
Transverse : 23 to 60°C	1.0E-4	cm/cm/°C	ISO 11359-2
Thermal Conductivity	0.24	W/m/K	ISO 8302
RTI Elec	120	°C	UL 746
RTI Imp	120	°C	UL 746
RTI Str	140	°C	UL 746
Electrical	Nominal Value	Unit	Test Method
Surface Resistivity	> 1.0E+15	ohms	IEC 60093
Volume Resistivity	> 1.0E+15	ohms · cm	IEC 60093
Dielectric Strength			
1.60 mm, in Oil	22	kV/mm	ASTM D149
3.20 mm, in Air	18	kV/mm	ASTM D149
0.800 mm, in Oil	31	kV/mm	IEC 60243-1
1.00 mm ²⁶	18	kV/mm	IEC 60243-1
1.60 mm, in Oil	24	kV/mm	IEC 60243-1
3.20 mm, in Oil	15	kV/mm	IEC 60243-1
Relative Permittivity			IEC 60250
50 Hz	2.90		

60 Hz	2.90		
100 Hz	3.10		
1 MHz	2.80		
Dissipation Factor			IEC 60250
50 Hz	1.0E-3		
60 Hz	1.0E-3		
100 Hz	2.0E-3		
1 MHz	0.010		
Arc Resistance ²⁷	PLC 6		ASTM D495
Comparative Tracking Index (CTI)	PLC 3		UL 746
Comparative Tracking Index			IEC 60112
--	175	V	
Solution B	100	V	
High Amp Arc Ignition (HAI)	PLC 0		UL 746
High Voltage Arc Resistance to Ignition (HVAR)	PLC 6		UL 746
High Voltage Arc Tracking Rate (HVTR)	PLC 4		UL 746
Hot-wire Ignition (HWI)	PLC 2		UL 746
Flammability	Nominal Value	Unit	Test Method
Flame Rating			UL 94
0.710 mm	V-0		
3.00 mm	5VA		
Glow Wire Flammability Index (1.00 mm)	960	°C	IEC 60695-2-12
Oxygen Index	30	%	ISO 4589-2
Injection	Nominal Value	Unit	
Drying Temperature	121	°C	
Drying Time	3.0 to 4.0	hr	
Drying Time, Maximum	12	hr	
Suggested Max Moisture	0.020	%	
Suggested Shot Size	40 to 80	%	
Rear Temperature	232 to 249	°C	
Middle Temperature	238 to 254	°C	
Front Temperature	243 to 260	°C	
Nozzle Temperature	238 to 254	°C	
Processing (Melt) Temp	243 to 260	°C	
Mold Temperature	48.9 to 76.7	°C	
Back Pressure	0.345 to 0.689	MPa	
Screw Speed	50 to 100	rpm	
Vent Depth	0.013 to 0.025	mm	
NOTE			
1.	Tensile Bar		
2.	2.3 to 4.6 mm		

3.	0.75 to 2.3 mm
4.	Tensile Bar
5.	0.75 to 2.3 mm
6.	2.3 to 4.6 mm
7.	5.0 mm/min
8.	Type I, 50 mm/min
9.	Type I, 50 mm/min
10.	Type I, 50 mm/min
11.	Type I, 50 mm/min
12.	1.3 mm/min
13.	2.0 mm/min
14.	1.3 mm/min
15.	80*10*4 sp=62mm
16.	80*10*4 sp=62mm
17.	80*10*4 sp=62mm
18.	80*10*4
19.	80*10*4
20.	80*10*4
21.	80*10*4
22.	120*10*4 mm
23.	120*10*4 mm
24.	80*10*4 mm
25.	Rate B (120°C/h), Loading 2 (50 N)
26.	Short-Time
27.	Tungsten Electrode

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