



VALOX™ 310SE0 resin

General Information

Product Description

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

General

Features	• Flame Retardant		
Uses	• Appliance Components • Bobbins	• Electrical/Electronic Applications • Housings	• Switches
Processing Method	• Injection Molding		

ASTM and ISO Properties ¹

Physical	Nominal Value	Unit	Test Method
Specific Gravity	1.40		ASTM D792
Specific Volume	19.7	in ³ /lb	ASTM D792
Density	1.40	g/cm ³	ISO 1183
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)	0.488	in ³ /10min	ISO 1133
Molding Shrinkage - Flow			Internal Method
-- ²	0.011 to 0.018	in/in	
-- ³	0.015 to 0.023	in/in	
-- ⁴	0.0090 to 0.016	in/in	
0.126 in	0.015 to 0.023	in/in	
Molding Shrinkage - Across Flow			Internal Method
-- ²	0.0090 to 0.019	in/in	
-- ⁴	0.010 to 0.017	in/in	
-- ³	0.016 to 0.024	in/in	
Water Absorption (Saturation, 73°F)	0.36	%	ISO 62
Water Absorption (Equilibrium, 73°F, 50% RH)	0.080	%	ISO 62
Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus ⁵	409000	psi	ASTM D638
Tensile Modulus	406000	psi	ISO 527-2/1

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Mechanical	Nominal Value	Unit	Test Method
Tensile Strength ⁶ (Yield)	8410	psi	ASTM D638
Tensile Stress (Yield)	7980	psi	ISO 527-2/50
Tensile Strength ⁶ (Break)	8410	psi	ASTM D638
Tensile Stress (Break)	5800	psi	ISO 527-2/50
Tensile Elongation ⁶ (Yield)	20	%	ASTM D638
Tensile Strain (Yield)	6.0	%	ISO 527-2/50
Tensile Elongation ⁶ (Break)	20	%	ASTM D638
Tensile Strain (Break)	20	%	ISO 527-2/50
Flexural Modulus ⁷ (1.97 in Span)	380000	psi	ASTM D790
Flexural Modulus ⁸	377000	psi	ISO 178
Flexural Strength ^{8, 9}	13100	psi	ISO 178
Flexural Strength ⁷ (Yield, 1.97 in Span)	14600	psi	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 -22°F ¹⁰	1.9	ft·lb/in ²	ISO 179/1eA
73°F ¹⁰	3.8	ft·lb/in ²	ISO 179/1eA
73°F	1.9	ft·lb/in ²	ISO 179/2C
Charpy Unnotched Impact Strength ¹⁰ -22°F	No Break		ISO 179/1eU
73°F	No Break		
Notched Izod Impact -22°F	0.41	ft·lb/in	ASTM D256
73°F	0.69	ft·lb/in	
Notched Izod Impact Strength ¹¹ -22°F	1.4	ft·lb/in ²	ISO 180/1A
73°F	2.4	ft·lb/in ²	
Unnotched Izod Impact (73°F)	30	ft·lb/in	ASTM D4812
Unnotched Izod Impact Strength ¹¹ -22°F	No Break		ISO 180/1U
73°F	No Break		
Instrumented Dart Impact (73°F, Total Energy)	1770	in·lb	ASTM D3763
Hardness	Nominal Value	Unit	Test Method
Rockwell Hardness (R-Scale)	120		ISO 2039-2
Ball Indentation Hardness (H 358/30)	15200	psi	ISO 2039-1
Thermal	Nominal Value	Unit	Test Method
Deflection Temperature Under Load 66 psi, Unannealed, 0.252 in	324	°F	ASTM D648
Heat Deflection Temperature ¹² 66 psi, Unannealed, 3.94 in Span	275	°F	ISO 75-2/Be

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Thermal	Nominal Value	Unit	Test Method
Deflection Temperature Under Load			ASTM D648
264 psi, Unannealed, 0.126 in	165	°F	
264 psi, Unannealed, 0.252 in	160	°F	
Heat Deflection Temperature			
264 psi, Unannealed, 3.94 in Span ¹²	140	°F	ISO 75-2/Ae
264 psi, Unannealed, 2.52 in Span ¹³	160	°F	ISO 75-2/Af
Vicat Softening Temperature	329	°F	ASTM D1525 ¹⁴
Vicat Softening Temperature			
--	414	°F	ISO 306/A50
--	329	°F	ISO 306/B50
--	329	°F	ISO 306/B120
Ball Pressure Test (257°F)	Pass		IEC 60695-10-2
CLTE - Flow			ASTM E831
-40 to 104°F	0.000044	in/in/°F	
140 to 280°F	0.000073	in/in/°F	
CLTE - Flow			ISO 11359-2
-40 to 104°F	0.000042	in/in/°F	
73 to 140°F	0.000056	in/in/°F	
CLTE - Transverse (-40 to 104°F)	0.000044	in/in/°F	ASTM E831
CLTE - Transverse			ISO 11359-2
-40 to 104°F	0.000041	in/in/°F	
73 to 140°F	0.000056	in/in/°F	
Thermal Conductivity	1.7	Btu·in/hr/ft²/°F	ISO 8302
RTI Elec	248	°F	UL 746
RTI Imp	248	°F	UL 746
RTI Str	284	°F	UL 746
Electrical	Nominal Value	Unit	Test Method
Surface Resistivity	> 1.0E+15	ohm	IEC 60093
Volume Resistivity	> 1.0E+15	ohm·cm	IEC 60093
Dielectric Strength			ASTM D149
0.0630 in, in Oil	560	V/mil	
0.126 in, in Air	470	V/mil	
Electric Strength			IEC 60243-1
0.0315 in, in Oil	790	V/mil	
0.0394 in ¹⁵	460	V/mil	
0.0630 in, in Oil	610	V/mil	
0.126 in, in Oil	380	V/mil	
Relative Permittivity			IEC 60250
50 Hz	2.90		
60 Hz	2.90		
100 Hz	3.10		
1 MHz	2.80		

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Electrical	Nominal Value	Unit	Test Method
Dissipation Factor			IEC 60250
50 Hz	0.0010		
60 Hz	0.0010		
100 Hz	0.0020		
1 MHz	0.010		
Arc Resistance ¹⁶	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
0.0280 in	V-0		
0.118 in	5VA		
Glow Wire Flammability Index (0.0394 in)	1760	°F	IEC 60695-2-12
Oxygen Index	30	%	ISO 4589-2

Processing Information			
Injection	Nominal Value	Unit	
Drying Temperature	250	°F	
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	450 to 480	°F	
Middle Temperature	460 to 490	°F	
Front Temperature	470 to 500	°F	
Nozzle Temperature	460 to 490	°F	
Processing (Melt) Temp	470 to 500	°F	
Mold Temperature	120 to 170	°F	
Back Pressure	50.0 to 100	psi	
Screw Speed	50 to 100	rpm	
Vent Depth	0.00050 to 0.0010	in	