

VALOX™ 4631 resin

Polybutylene Terephthalate
SABIC Innovative Plastics Europe

Message:

VALOX 4631 is a 30% glass reinforced, flame retarded PBT injection moulding resin with good electrical properties and excellent mechanical properties.

General Information			
UL YellowCard	E45329-236605		
Filler / Reinforcement	Glass Fiber,30% Filler by Weight		
Features	Flame Retardant		
	Good Electrical Properties		
RoHS Compliance	RoHS Compliant		
Processing Method	Injection Molding		
Physical	Nominal Value	Unit	Test Method
Specific Gravity	1.67	g/cm ³	ASTM D792, ISO 1183
Melt Mass-Flow Rate (MFR)			ASTM D1238
250°C/2.16 kg	13	g/10 min	
250°C/5.0 kg	67	g/10 min	
265°C/5.0 kg	90	g/10 min	
266°C/5.0 kg	90	g/10 min	
Melt Volume-Flow Rate (MVR)			ISO 1133
250°C/5.0 kg	40.0	cm ³ /10min	
265°C/5.0 kg	65.0	cm ³ /10min	
Molding Shrinkage ¹			Internal Method
Flow	0.10 to 0.30	%	
Across Flow	0.40 to 0.70	%	
Water Absorption			ISO 62
Saturation, 23°C	0.25	%	
Equilibrium, 23°C, 50% RH	0.070	%	
Hardness	Nominal Value	Unit	Test Method
Rockwell Hardness (R-Scale)	118		ISO 2039-2
Ball Indentation Hardness (H 358/30)	115	MPa	ISO 2039-1
Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus			
-- ²	11500	MPa	ASTM D638
--	11500	MPa	ISO 527-2/1
Tensile Strength			
Yield ³	130	MPa	ASTM D638
Yield	130	MPa	ISO 527-2/5

Break ⁴	130	MPa	ASTM D638
Break	130	MPa	ISO 527-2/5
Tensile Elongation			
Yield ⁵	2.0	%	ASTM D638
Yield	2.0	%	ISO 527-2/5
Break ⁶	2.0	%	ASTM D638
Break	2.0	%	ISO 527-2/5
Flexural Modulus			
50.0 mm Span ⁷	9000	MPa	ASTM D790
-- ⁸	9600	MPa	ISO 178
Flexural Stress			
--	200	MPa	ISO 178
Yield, 50.0 mm Span ⁹	200	MPa	ASTM D790
Break, 50.0 mm Span ¹⁰	200	MPa	ASTM D790
Flexural Strain at Break ¹¹	3.0	%	ISO 178
Filler Content	30	%	ASTM D229
Impact	Nominal Value	Unit	Test Method
Charpy Notched Impact Strength			
-30°C ¹²	10	kJ/m ²	ISO 179/1eA
-30°C	9.0	kJ/m ²	ISO 179/2C
23°C ¹³	10	kJ/m ²	ISO 179/1eA
23°C	11	kJ/m ²	ISO 179/2C
Charpy Unnotched Impact Strength			
-30°C ¹⁴	55	kJ/m ²	ISO 179/1eU
-30°C	50	kJ/m ²	ISO 179/2U
23°C ¹⁵	50	kJ/m ²	ISO 179/1eU, ISO 179/2U
Notched Izod Impact			
-30°C	80	J/m	ASTM D256
0°C	80	J/m	ASTM D256
23°C	80	J/m	ASTM D256
-30°C ¹⁶	8.0	kJ/m ²	ISO 180/1A
0°C ¹⁷	8.0	kJ/m ²	ISO 180/1A
23°C ¹⁸	8.0	kJ/m ²	ISO 180/1A
Unnotched Izod Impact			
-30°C	660	J/m	ASTM D4812
23°C	660	J/m	ASTM D4812
-30°C ¹⁹	45	kJ/m ²	ISO 180/1U
23°C ²⁰	45	kJ/m ²	ISO 180/1U
Thermal	Nominal Value	Unit	Test Method
Deflection Temperature Under Load			
0.45 MPa, Unannealed, 3.20 mm	220	°C	ASTM D648
0.45 MPa, Unannealed, 100 mm Span ²¹	220	°C	ISO 75-2/Be

0.45 MPa, Unannealed, 64.0 mm Span ²²	220	°C	ISO 75-2/Bf
1.8 MPa, Unannealed, 3.20 mm	205	°C	ASTM D648
1.8 MPa, Unannealed, 64.0 mm Span ²³	205	°C	ISO 75-2/Af
Vicat Softening Temperature			
--	220	°C	ASTM D1525, ISO 306/A50 14 ²⁴
--	205	°C	ASTM D1525, ISO 306/B50, ISO 306/B120 ²⁵
Ball Pressure Test (125°C)	Pass		IEC 60695-10-2
CLTE			ISO 11359-2
Flow : -40 to 40°C	2.2E-5	cm/cm/°C	
Flow : 23 to 80°C	1.6E-5	cm/cm/°C	
Flow : 23 to 150°C	1.4E-5	cm/cm/°C	
Transverse : -40 to 40°C	8.2E-5	cm/cm/°C	
Transverse : 23 to 80°C	1.2E-4	cm/cm/°C	
Transverse : 23 to 150°C	1.3E-4	cm/cm/°C	
RTI Elec	130	°C	UL 746
RTI Imp	130	°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	ASTM D257, IEC 60093
Electric Strength			IEC 60243-1
0.800 mm, in Oil	27	kV/mm	
1.60 mm, in Oil	23	kV/mm	
3.20 mm, in Oil	19	kV/mm	
Dielectric Constant			
1 MHz	3.50		ASTM D150, IEC 60250
50 Hz	3.00		IEC 60250
60 Hz	3.00		IEC 60250
Dissipation Factor			
1 MHz	0.010		ASTM D150, IEC 60250
50 Hz	1.0E-3		IEC 60250
60 Hz	1.0E-3		IEC 60250
Comparative Tracking Index (CTI)	PLC 2		UL 746
Comparative Tracking Index	250	V	IEC 60112
High Amp Arc Ignition (HAI)	PLC 3		UL 746
High Voltage Arc Tracking Rate (HVTR)	PLC 4		UL 746
Hot-wire Ignition (HWI)	PLC 0		UL 746
Flammability	Nominal Value	Unit	Test Method
Flame Rating (0.750 mm)	V-0		UL 94
Glow Wire Flammability Index (3.00 mm)	960	°C	IEC 60695-2-12
Oxygen Index	34	%	ISO 4589-2

Fill Analysis	Nominal Value	Unit	Test Method
Melt Viscosity (260°C, 1500 sec ⁻¹)	115	Pa·s	ISO 11443
Injection	Nominal Value	Unit	
Drying Temperature	110 to 120	°C	
Drying Time	2.0 to 4.0	hr	
Suggested Max Moisture	0.020	%	
Hopper Temperature	40.0 to 60.0	°C	
Rear Temperature	230 to 245	°C	
Middle Temperature	240 to 255	°C	
Front Temperature	245 to 265	°C	
Nozzle Temperature	240 to 260	°C	
Processing (Melt) Temp	250 to 270	°C	
Mold Temperature	40.0 to 100	°C	
NOTE			
1.	Tensile Bar		
2.	5.0 mm/min		
3.	Type I, 5.0 mm/min		
4.	Type I, 5.0 mm/min		
5.	Type I, 5.0 mm/min		
6.	Type I, 5.0 mm/min		
7.	1.3 mm/min		
8.	2.0 mm/min		
9.	1.3 mm/min		
10.	1.3 mm/min		
11.	2 mm/min		
12.	80*10*4 sp=62mm		
13.	80*10*4 sp=62mm		
14.	80*10*4 sp=62mm		
15.	80*10*4 sp=62mm		
16.	80*10*4		
17.	80*10*4		
18.	80*10*4		
19.	80*10*4		
20.	80*10*4		
21.	120*10*4 mm		
22.	80*10*4 mm		
23.	80*10*4 mm		
24.	Rate A (50°C/h), Loading 2 (50 N)		
25.	Rate B (120°C/h), Loading 2 (50 N)		

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