

VALOX™ 4521 resin

Polybutylene Terephthalate
SABIC Innovative Plastics Europe

Message:

VALOX 4521 is a high flow, 20% glass reinforced flame retardant PBT injection moulding resin. Applications: electrical applications.

General Information			
UL YellowCard	E45329-236602		
Filler / Reinforcement	Glass Fiber,20% Filler by Weight		
Features	Flame Retardant		
	High Flow		
Uses	Electrical/Electronic Applications		
RoHS Compliance	RoHS Compliant		
Processing Method	Injection Molding		
Physical	Nominal Value	Unit	Test Method
Specific Gravity	1.58	g/cm ³	ASTM D792, ISO 1183
Melt Mass-Flow Rate (MFR)			
265°C/5.0 kg	90	g/10 min	ASTM D1238
250°C/2.16 kg	26	g/10 min	ISO 1133
Melt Volume-Flow Rate (MVR)			ISO 1133
250°C/2.16 kg	19.0	cm ³ /10min	
250°C/5.0 kg	65.0	cm ³ /10min	
265°C/5.0 kg	95.0	cm ³ /10min	
Molding Shrinkage ¹			Internal Method
Flow	0.30 to 0.70	%	
Across Flow	0.60 to 0.90	%	
Water Absorption			ISO 62
Saturation, 23°C	0.28	%	
Equilibrium, 23°C, 50% RH	0.090	%	
Hardness	Nominal Value	Unit	Test Method
Rockwell Hardness (R-Scale)	120		ISO 2039-2
Ball Indentation Hardness (H 358/30)	142	MPa	ISO 2039-1
Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus			
-- ²	7800	MPa	ASTM D638
--	8000	MPa	ISO 527-2/1
Tensile Strength			
Yield ³	110	MPa	ASTM D638
Yield	110	MPa	ISO 527-2/5

Break ⁴	110	MPa	ASTM D638
Break	110	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	3.0	%	ISO 527-2/5
Flexural Modulus			
50.0 mm Span ⁷	6500	MPa	ASTM D790
-- ⁸	7000	MPa	ISO 178
Flexural Stress			
--	160	MPa	ISO 178
Yield, 50.0 mm Span ⁹	155	MPa	ASTM D790
Break, 50.0 mm Span ¹⁰	155	MPa	ASTM D790
Flexural Strain at Break ¹¹	3.0	%	ISO 178
Filler Content	20	%	ASTM D229
Impact	Nominal Value	Unit	Test Method
Charpy Notched Impact Strength			
-30°C ¹²	5.5	kJ/m ²	ISO 179/1eA
-30°C	8.0	kJ/m ²	ISO 179/2C
23°C ¹³	5.5	kJ/m ²	ISO 179/1eA
23°C	8.0	kJ/m ²	ISO 179/2C
Charpy Unnotched Impact Strength			
-30°C ¹⁴	28	kJ/m ²	ISO 179/1eU
-30°C	30	kJ/m ²	ISO 179/2U
23°C ¹⁵	30	kJ/m ²	ISO 179/1eU
23°C	40	kJ/m ²	ISO 179/2U
Notched Izod Impact			
-30°C	65	J/m	ASTM D256
0°C	70	J/m	ASTM D256
23°C	70	J/m	ASTM D256
-30°C ¹⁶	7.0	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	470	J/m	ASTM D4812
23°C	530	J/m	ASTM D4812
-30°C ¹⁹	30	kJ/m ²	ISO 180/1U
23°C ²⁰	35	kJ/m ²	ISO 180/1U
Thermal	Nominal Value	Unit	Test Method
Deflection Temperature Under Load			
0.45 MPa, Unannealed, 3.20 mm	218	°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, 100 mm Span ²³	205	°C	ISO 75-2/Ae
1.8 MPa, Unannealed, 64.0 mm Span ²⁴	207	°C	ISO 75-2/Af
Vicat Softening Temperature			
--	218	°C	ASTM D1525 ²⁵
--	206	°C	ASTM D1525 ²⁶
--	220	°C	ISO 306/A50
--	210	°C	ISO 306/B50
--	208	°C	ISO 306/B120
Ball Pressure Test (125°C)	Pass		IEC 60695-10-2
CLTE			
Flow : 23 to 150°C	2.5E-5	cm/cm/°C	ASTM E831
Flow : -40 to 40°C	2.7E-5	cm/cm/°C	ISO 11359-2
Flow : 23 to 80°C	2.5E-5	cm/cm/°C	ISO 11359-2
Flow : 23 to 150°C	2.0E-5	cm/cm/°C	ISO 11359-2
Transverse : 23 to 150°C	1.8E-4	cm/cm/°C	ASTM E831
Transverse : -40 to 40°C	7.4E-5	cm/cm/°C	ISO 11359-2
Transverse : 23 to 80°C	1.2E-4	cm/cm/°C	ISO 11359-2
Transverse : 23 to 150°C	1.3E-4	cm/cm/°C	ISO 11359-2
Thermal Conductivity	0.27	W/m/K	ISO 8302
RTI Elec	130	°C	UL 746
RTI Imp	130	°C	UL 746
RTI Str	130	°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
Dielectric Strength			ASTM D149, IEC 60243-1
0.800 mm, in Oil	37	kV/mm	
1.60 mm, in Oil	25	kV/mm	
3.20 mm, in Oil	20	kV/mm	
Dielectric Constant			
1 MHz	3.40		ASTM D150, IEC 60250
50 Hz	3.30		IEC 60250
60 Hz	3.30		IEC 60250
Dissipation Factor			
1 MHz	0.015		ASTM D150, IEC 60250
50 Hz	1.0E-3		IEC 60250
60 Hz	1.0E-3		IEC 60250
Arc Resistance ²⁷	PLC 5		ASTM D495
Comparative Tracking Index (CTI)	PLC 2		UL 746

Comparative Tracking Index	275	V	IEC 60112
High Amp Arc Ignition (HAI)	PLC 0		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			UL 94
0.750 mm	V-0		
1.50 mm	5VB		
2.00 mm	5VA		
Glow Wire Flammability Index (3.20 mm)	960	°C	IEC 60695-2-12
Oxygen Index	29	%	ISO 4589-2
Fill Analysis	Nominal Value	Unit	Test Method
Melt Viscosity (260°C, 1500 sec ⁻¹)	95.0	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.	120*10*4 mm
24.	80*10*4 mm
25.	Rate A (50°C/h), Loading 2 (50 N)
26.	Rate B (120°C/h), Loading 2 (50 N)
27.	Tungsten Electrode

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