

VALOX™ 4031 resin

Polybutylene Terephthalate
SABIC Innovative Plastics Europe

Message:

VALOX 4031 is a 30% high strength glass fibre reinforced PBT injection moulding resin with excellent strength, stiffness and heat resistance. Applications: appliance handles, spotlights, electric motors.

General Information			
Filler / Reinforcement	Glass fiber reinforced material, 30% filler by weight		
Features	Rigidity, high		
	High strength		
	Heat resistance, high		
Uses	Handle		
	Home appliance components		
Processing Method	Injection molding		
Physical	Nominal Value	Unit	Test Method
Specific Gravity	1.54	g/cm ³	ASTM D792, ISO 1183
Melt Mass-Flow Rate (MFR) (266°C/5.0 kg)	50	g/10 min	ASTM D1238
Melt Volume-Flow Rate (MVR)			ISO 1133
250°C/2.16 kg	12.0	cm ³ /10min	ISO 1133
250°C/5.0 kg	30.0	cm ³ /10min	ISO 1133
265°C/5.0 kg	40.0	cm ³ /10min	ISO 1133
Molding Shrinkage ¹			Internal method
Flow	0.30 - 0.70	%	Internal method
Transverse flow	0.50 - 1.0	%	Internal method
Water Absorption			ISO 62
Saturated, 23°C	0.26	%	ISO 62
Equilibrium, 23°C, 50% RH	0.060	%	ISO 62
Hardness	Nominal Value	Unit	Test Method
Rockwell Hardness (R-Scale)	125		ISO 2039-2
Ball Indentation Hardness (H 358/30)	125	MPa	ISO 2039-1
Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus			
-- ²	10000	MPa	ASTM D638
--	10000	MPa	ISO 527-2/1
Tensile Strength			
Yield ³	140	MPa	ASTM D638
Yield	135	MPa	ISO 527-2/5

Fracture ⁴	140	MPa	ASTM D638
Fracture	135	MPa	ISO 527-2/5
Tensile Elongation			
Yield ⁵	3.0	%	ASTM D638
Yield	2.0	%	ISO 527-2/5
Fracture ⁶	3.0	%	ASTM D638
Fracture	2.0	%	ISO 527-2/5
Flexural Modulus			
50.0mm span ⁷	7900	MPa	ASTM D790
-- ⁸	8300	MPa	ISO 178
Flexural Stress			
--	200	MPa	ISO 178
--	210	MPa	ISO 178
Yield, 50.0mm span ⁹	190	MPa	ASTM D790
Fracture, 50.0mm span ¹⁰	190	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	6.0	kJ/m ²	ISO 179/1eA
-30°C	12	kJ/m ²	ISO 179/2C
23°C ¹³	7.0	kJ/m ²	ISO 179/1eA
23°C	12	kJ/m ²	ISO 179/2C
Charpy Unnotched Impact Strength			
-30°C ¹⁴	55	kJ/m ²	ISO 179/1eU
-30°C	60	kJ/m ²	ISO 179/2U
23°C ¹⁵	50	kJ/m ²	ISO 179/1eU
23°C	65	kJ/m ²	ISO 179/2U
Notched Izod Impact			
-30°C	100	J/m	ASTM D256
0°C	100	J/m	ASTM D256
23°C	100	J/m	ASTM D256
-30°C ¹⁶	10	kJ/m ²	ISO 180/1A
0°C ¹⁷	11	kJ/m ²	ISO 180/1A
23°C ¹⁸	11	kJ/m ²	ISO 180/1A
Unnotched Izod Impact			
-30°C	880	J/m	ASTM D4812
23°C	880	J/m	ASTM D4812
-30°C ¹⁹	55	kJ/m ²	ISO 180/1U
23°C ²⁰	55	kJ/m ²	ISO 180/1U
Thermal	Nominal Value	Unit	Test Method
Deflection Temperature Under Load			

0.45 MPa, unannealed, 3.20mm	220	°C	ASTM D648
0.45 MPa, unannealed, 100 mm span ²¹	220	°C	ISO 75-2/Be
0.45 MPa, unannealed, 64.0mm span ²²	220	°C	ISO 75-2/Bf
1.8 MPa, unannealed, 3.20mm	205	°C	ASTM D648
1.8 MPa, unannealed, 100 mm span ²³	210	°C	ISO 75-2/Ae
1.8 MPa, unannealed, 64.0mm span ²⁴	205	°C	ISO 75-2/Af
Vicat Softening Temperature			
--	215	°C	ASTM D1525, ISO 306/B50, ISO 306/B120 ²⁵
--	220	°C	ASTM D1525, ISO 306/A50 15 ²⁶
Ball Pressure Test (125°C)	Pass		IEC 60695-10-2
Linear thermal expansion coefficient			ISO 11359-2
Flow: -40 to 40°C	2.1E-5	cm/cm/°C	ISO 11359-2
Flow: 23 to 80°C	3.0E-5	cm/cm/°C	ISO 11359-2
Flow: 23 to 150°C	2.0E-5	cm/cm/°C	ISO 11359-2
Lateral: -40 to 40°C	7.4E-5	cm/cm/°C	ISO 11359-2
Lateral: 23 to 80°C	1.2E-4	cm/cm/°C	ISO 11359-2
Horizontal: 23 to 150°C	1.7E-4	cm/cm/°C	ISO 11359-2
RTI Elec	140	°C	UL 746
RTI Imp	140	°C	UL 746
RTI	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
Dielectric Strength			
0.800 mm, in Oil	26	kV/mm	ASTM D149
1.60 mm, in Oil	24	kV/mm	ASTM D149
3.20 mm, in Oil	18	kV/mm	ASTM D149
0.800mm, in oil	26	kV/mm	IEC 60243-1
1.60mm, in oil	24	kV/mm	IEC 60243-1
3.20mm, in oil	15	kV/mm	IEC 60243-1
Relative Permittivity			IEC 60250
50 Hz	3.30		IEC 60250
60 Hz	3.30		IEC 60250
1 MHz	3.10		IEC 60250
Dissipation Factor			IEC 60250
50 Hz	1.6E-3		IEC 60250
60 Hz	1.6E-3		IEC 60250
1 MHz	0.014		IEC 60250
Arc Resistance ²⁷	PLC 5		ASTM D495
Comparative Tracking Index (CTI)	PLC 0		UL 746
Comparative Tracking Index	250	V	IEC 60112

High Amp Arc Ignition (HAI)	PLC 1		UL 746
High Voltage Arc Tracking Rate (HVTR)	PLC 1		UL 746
Hot-wire Ignition (HWI)	PLC 1		UL 746
Flammability	Nominal Value	Unit	Test Method
Flame Rating			UL 94
0.840 mm	HB		UL 94
6.00 mm	HB		UL 94
Glow Wire Flammability Index (1.00 mm)	750	°C	IEC 60695-2-12
Fill Analysis	Nominal Value	Unit	Test Method
Melt Viscosity (260°C, 1500 sec ⁻¹)	150	Pa · s	ISO 11443
Injection	Nominal Value	Unit	
Drying Temperature	110 - 120	°C	
Drying Time	2.0 - 4.0	hr	
Suggested Max Moisture	0.020	%	
Hopper Temperature	40.0 - 60.0	°C	
Rear Temperature	230 - 245	°C	
Middle Temperature	240 - 255	°C	
Front Temperature	245 - 265	°C	
Nozzle Temperature	240 - 260	°C	
Processing (Melt) Temp	250 - 270	°C	
Mold Temperature	40.0 - 100	°C	
NOTE			
1.	Tensile Bar		
2.	5.0 mm/min		
3.	Type 1, 5.0 mm/min		
4.	Type 1, 5.0 mm/min		
5.	Type 1, 5.0 mm/min		
6.	Type 1, 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.	标准 B (120°C/h), 载荷2 (50N)
26.	速率 A (50°C/h), 载荷2 (50N)
27.	Tungsten electrode

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