

VALOX™ ENH4560 resin

Polybutylene Terephthalate
SABIC Innovative Plastics Europe

Message:

VALOX ENH4560 resin is a non-brominated/non-chlorinated flame retardant product based on VALOX PBT resin.

General Information			
UL YellowCard	E45329-100522223		
Features	Bromine Free		
	Chlorine Free		
	Flame Retardant		
RoHS Compliance	RoHS Compliant		
Processing Method	Injection Molding		
Physical	Nominal Value	Unit	Test Method
Specific Gravity	1.56	g/cm ³	ASTM D792, ISO 1183
Melt Mass-Flow Rate (MFR) (265°C/5.0 kg)	23	g/10 min	ASTM D1238
Melt Volume-Flow Rate (MVR) (250°C/5.0 kg)	16.0	cm ³ /10min	ISO 1133
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			
-- ¹	11000	MPa	ASTM D638
--	11000	MPa	ISO 527-2/1
Tensile Strength			
Yield ²	110	MPa	ASTM D638
Yield	105	MPa	ISO 527-2/5
Break ³	110	MPa	ASTM D638
Break	105	MPa	ISO 527-2/5
Tensile Elongation			
Yield ⁴	2.0	%	ASTM D638
Yield	2.0	%	ISO 527-2/5
Break ⁵	2.0	%	ASTM D638
Break	2.0	%	ISO 527-2/5
Flexural Modulus			
50.0 mm Span ⁶	9000	MPa	ASTM D790
-- ⁷	10000	MPa	ISO 178
Flexural Stress			

--	170	MPa	ISO 178
Yield, 50.0 mm Span ⁸	150	MPa	ASTM D790
Break, 50.0 mm Span ⁹	150	MPa	ASTM D790
Flexural Strain at Break ¹⁰	2.0	%	ISO 178
Filler Content	30	%	ASTM D229
Impact	Nominal Value	Unit	Test Method
Charpy Notched Impact Strength			ISO 179/2C
-30°C	10	kJ/m ²	
23°C	10	kJ/m ²	
Charpy Unnotched Impact Strength			ISO 179/2U
-30°C	35	kJ/m ²	
23°C	40	kJ/m ²	
Notched Izod Impact			
-30°C	75	J/m	ASTM D256
0°C	75	J/m	ASTM D256
23°C	75	J/m	ASTM D256
-30°C ¹¹	9.0	kJ/m ²	ISO 180/1A
0°C ¹²	9.0	kJ/m ²	ISO 180/1A
23°C ¹³	9.0	kJ/m ²	ISO 180/1A
Unnotched Izod Impact			
-30°C	500	J/m	ASTM D4812
23°C	500	J/m	ASTM D4812
-30°C ¹⁴	37	kJ/m ²	ISO 180/1U
23°C ¹⁵	37	kJ/m ²	ISO 180/1U
Thermal	Nominal Value	Unit	Test Method
Deflection Temperature Under Load			
0.45 MPa, Unannealed, 3.20 mm	223	°C	ASTM D648
	225		
0.45 MPa, Unannealed, 64.0 mm Span ¹⁶	224	°C	ISO 75-2/Bf
1.8 MPa, Unannealed, 3.20 mm	210	°C	ASTM D648
1.8 MPa, Unannealed, 64.0 mm Span ¹⁷	210	°C	ISO 75-2/Af
Vicat Softening Temperature			
--	217	°C	ASTM D1525 ¹⁸
--	207	°C	ASTM D1525 ¹⁹
--	220	°C	ISO 306/A50
--	206	°C	ISO 306/B50
--	205	°C	ISO 306/B120
Ball Pressure Test (125°C)	Pass		IEC 60695-10-2
CLTE			ISO 11359-2
Flow : -40 to 40°C	2.0E-5	cm/cm/°C	

Flow : 23 to 150°C	2.5E-5	cm/cm/°C	
Transverse : -40 to 40°C	6.2E-5	cm/cm/°C	
Transverse : 23 to 150°C	1.5E-4	cm/cm/°C	
RTI Elec	140	°C	UL 746
RTI Imp	125	°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+14	ohms · cm	ASTM D257, IEC 60093
Dielectric Strength			ASTM D149, IEC 60243-1
0.800 mm, in Oil	32	kV/mm	
1.60 mm, in Oil	22	kV/mm	
3.20 mm, in Oil	18	kV/mm	
Dielectric Constant (1 MHz)	3.80		ASTM D150, IEC 60250
Dissipation Factor (1 MHz)	0.14		ASTM D150, IEC 60250
Comparative Tracking Index (CTI)	PLC 0		UL 746
Comparative Tracking Index	600	V	IEC 60112
High Amp Arc Ignition (HAI)	PLC 0		UL 746
Hot-wire Ignition (HWI)	PLC 0		UL 746
Flammability	Nominal Value	Unit	Test Method
Flame Rating			UL 94
0.800 mm	V-0		
3.00 mm	5VB		
Glow Wire Flammability Index (2.00 mm)	960	°C	IEC 60695-2-12
Glow Wire Ignition Temperature			IEC 60695-2-13
1.00 mm	750	°C	
2.00 mm	750	°C	
3.00 mm	800	°C	
Fill Analysis	Nominal Value	Unit	Test Method
Melt Viscosity (260°C, 1500 sec^-1)	110	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 240	°C	
Middle Temperature	235 to 250	°C	
Front Temperature	240 to 260	°C	
Nozzle Temperature	230 to 255	°C	
Processing (Melt) Temp	245 to 260	°C	
Mold Temperature	40.0 to 100	°C	
NOTE			

1.	5.0 mm/min
2.	Type I, 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.	1.3 mm/min
7.	2.0 mm/min
8.	1.3 mm/min
9.	1.3 mm/min
10.	2 mm/min
11.	80*10*4
12.	80*10*4
13.	80*10*4
14.	80*10*4
15.	80*10*4
16.	80*10*4 mm
17.	80*10*4 mm
18.	Rate A (50°C/h), Loading 2 (50 N)
19.	Rate B (120°C/h), Loading 2 (50 N)

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