

Technical Data

Product Description

VALOX™ FR Resin
865 - Europe

VALOX 865 is a 30% glass filled, flame retardant Polybutylene Terephthalate/Polyethylene Terephthalate (PBT/PET) injection moldable flame retardant grade. It has excellent chemical resistance and a UL94V0@1.5mm and 5VA@3.0mm flame rating. This grade also has improved aesthetics compared to standard PBT and is an excellent candidate for a wide variety of applications including steam irons, appliance, and lighting parts.

Generic
PBT

This data represents typical values that have been calculated from all products classified as: Generic PBT

This information is provided for comparative purposes only.

General

VALOX™ FR Resin
865 - Europe

Generic
PBT

Manufacturer / Supplier

- SABIC

- Generic

Generic Symbol

- PBT

- PBT

Material Status

- Commercial: Active

- Commercial: Active

UL Yellow Card ¹

- E45329-236635

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Search for UL Yellow Card

- SABIC

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Availability

- Europe

- Africa & Middle East
- Asia Pacific
- Europe
- Latin America
- North America

Uses

- Appliances
- Automotive Under the Hood
- Electrical/Electronic Applications
- Lighting Applications
- Water Management

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Also Available In

- Asia Pacific
- Latin America
- North America

- Asia Pacific
- Europe
- Latin America
- North America

Physical

VALOX™ FR Resin
865 - Europe

Generic
PBT

Unit

Test Method

Density / Specific Gravity

--

1.66

1.26 to 1.55

ASTM D792

--

1.65

1.29 to 1.32

g/cm³

ISO 1183

--

--

1.31

g/cm³

ASTM D1505

Apparent (Bulk) Density

--

0.80 to 0.81

g/cm³

ISO 60

Melt Mass-Flow Rate (MFR)

250°C/2.16 kg

--

8.0 to 56

g/10 min

ASTM D1238

266°C/5.0 kg

70

--

g/10 min

ASTM D1238

250°C/2.16 kg

--

3.0 to 72

g/10 min

ISO 1133

Melt Volume-Flow Rate (MVR)

ISO 1133

250°C/2.16 kg

--

3.7 to 52

cm³/10min

250°C/5.0 kg

23

--

cm³/10min

265°C/1.2 kg

7.0

--

cm³/10min

265°C/2.16 kg

15

--

cm³/10min

265°C/5.0 kg

50

--

cm³/10min



Physical	VALOX™ FR Resin 865 - Europe	Generic PBT	Unit	Test Method
Molding Shrinkage				
Flow	--	5.4E-3 to 0.021	in/in	ASTM D955
Across Flow	--	9.9E-3 to 0.020	in/in	ASTM D955
--	--	0.19 to 2.3	%	ISO 294-4
Across Flow ³	0.60 to 1.0	--	%	Internal Method
Flow ³	0.40 to 0.80	--	%	Internal Method
Water Absorption				
24 hr	--	0.050 to 0.11	%	ASTM D570
24 hr, 73°F	--	0.040 to 0.20	%	ISO 62
Saturation	--	0.20 to 0.50	%	ASTM D570
Saturation, 73°F	0.32	0.077 to 0.52	%	ISO 62
Equilibrium	--	0.070 to 0.090	%	ASTM D570
Equilibrium, 73°F, 50% RH	0.030	0.054 to 0.27	%	ISO 62
Viscosity Number (Reduced Viscosity)	--	0.6 to 160.0	ml/g	ISO 1628
Viscosity Number	--	1.23 to 160	cm ³ /g	ISO 307
Intrinsic Viscosity	--	0.74 to 1.3	dl/g	
Mechanical	VALOX™ FR Resin 865 - Europe	Generic PBT	Unit	Test Method
Tensile Modulus				
--	--	307000 to 415000	psi	ASTM D638
-- ⁴	1.60E+6	--	psi	ASTM D638
--	--	304000 to 417000	psi	ISO 527-1
--	1.60E+6	--	psi	ISO 527-1/1
Tensile Strength				
Yield ⁵	18900	--	psi	ASTM D638
Yield	--	6600 to 17400	psi	ASTM D638
Yield	--	5570 to 8950	psi	ISO 527-2
Yield	18900	--	psi	ISO 527-2/5
Break	--	3190 to 20600	psi	ASTM D638
Break ⁵	18900	--	psi	ASTM D638
Break	--	4880 to 8790	psi	ISO 527-2
Break	18900	--	psi	ISO 527-2/5
--	--	6440 to 8760	psi	ASTM D638
--	--	4570 to 8740	psi	ISO 527-2
Tensile Elongation				
Yield	--	1.0 to 16	%	ASTM D638
Yield ⁵	2.0	--	%	ASTM D638
Yield	--	1.8 to 11	%	ISO 527-2
Yield	2.0	--	%	ISO 527-2/5
Break	--	0.50 to 110	%	ASTM D638
Break ⁵	2.0	--	%	ASTM D638
Break	--	1.6 to 23	%	ISO 527-2
Break	2.0	--	%	ISO 527-2/5
Nominal Tensile Strain at Break	--	2.5 to 52	%	ISO 527-2



Mechanical	VALOX™ FR Resin 865 - Europe	Generic PBT	Unit	Test Method
Tensile Creep Modulus				ISO 899-1
1 hr	--	348000	psi	
1000 hr	--	228000	psi	
Flexural Modulus				
1.97 in Span ⁶	1.16E+6	--	psi	ASTM D790
--	--	247000 to 431000	psi	ASTM D790
--	--	303000 to 424000	psi	ISO 178
-- ⁷	1.33E+6	--	psi	ISO 178
Flexural Strength				
--	--	8460 to 14400	psi	ASTM D790
--	--	1160 to 16400	psi	ISO 178
-- ^{7,8}	28300	--	psi	ISO 178
Yield	--	10800 to 12400	psi	ASTM D790
Yield, 1.97 in Span ⁶	26000	--	psi	ASTM D790
Break	--	290 to 29700	psi	ASTM D790
Break, 1.97 in Span ⁶	26000	--	psi	ASTM D790
Flexural Strain - at Break ⁹	3.0	--	%	ISO 178
Compressive Strength	--	2800 to 18000	psi	ASTM D695
Poisson's Ratio	--	0.38		ASTM E132
Coefficient of Friction	--	0.12 to 0.41		ASTM D1894
Taber Abrasion Resistance	--	9.00 to 55.2	mg	ASTM D1044

Impact	VALOX™ FR Resin 865 - Europe	Generic PBT	Unit	Test Method
Charpy Notched Impact Strength				
--	--	0.70 to 4.9	ft·lb/in ²	ISO 179
-22°F ¹⁰	3.8	--	ft·lb/in ²	ISO 179/1eA ISO 179/2C
73°F ¹⁰	3.8	--	ft·lb/in ²	ISO 179/1eA ISO 179/2C
Charpy Unnotched Impact Strength				
--	--	5.5 to 96	ft·lb/in ²	ISO 179
-22°F ¹⁰	No Break	--		ISO 179/1eU
-22°F	24	--	ft·lb/in ²	ISO 179/2U
73°F ¹⁰	24	--	ft·lb/in ²	ISO 179/1eU
73°F	26	--	ft·lb/in ²	ISO 179/2U
Notched Izod Impact				
--	--	0.54 to 1.9	ft·lb/in	ASTM D256
-22°F	1.5	--	ft·lb/in	ASTM D256
32°F	1.5	--	ft·lb/in	ASTM D256
73°F	1.5	--	ft·lb/in	ASTM D256
--	--	0.95 to 5.1	ft·lb/in ²	ISO 180
-22°F ¹¹	3.3	--	ft·lb/in ²	ISO 180/1A
32°F ¹¹	3.8	--	ft·lb/in ²	ISO 180/1A
73°F ¹¹	3.8	--	ft·lb/in ²	ISO 180/1A
Notched Izod Impact (Area)	--	1.57 to 19.0	ft·lb/in ²	ASTM D256



Impact	VALOX™ FR Resin 865 - Europe	Generic PBT	Unit	Test Method
Unnotched Izod Impact				
--	--	0.42 to 60	ft·lb/in	ASTM D4812
-22°F	12	--	ft·lb/in	ASTM D4812
73°F	12	--	ft·lb/in	ASTM D4812
--	--	11 to 72	ft·lb/in ²	ISO 180
-22°F ¹¹	21	--	ft·lb/in ²	ISO 180/1U
73°F ¹¹	24	--	ft·lb/in ²	ISO 180/1U
Instrumented Dart Impact				
--	--	17.7 to 543	in·lb	ASTM D3763
--	--	2.36 to 88.5	ft·lb	ISO 6603-2
Multi-Axial Instrumented Impact Peak Force				
--	--	504 to 1170	lbf	ISO 6603-2
Gardner Impact				
--	--	319 to 381	in·lb	ASTM D3029
Hardness	VALOX™ FR Resin 865 - Europe	Generic PBT	Unit	Test Method
Rockwell Hardness				
--	--	117 to 122		ASTM D785
--	--	71 to 125		ISO 2039-2
R-Scale	120	--		ISO 2039-2
Shore Hardness				
--	--	75 to 81		ISO 868
Ball Indentation Hardness				
--	--	17100 to 23600	psi	ISO 2039-1
H 358/30	16700	--	psi	
Thermal	VALOX™ FR Resin 865 - Europe	Generic PBT	Unit	Test Method
Deflection Temperature Under Load				
66 psi, Unannealed	--	282 to 439	°F	ASTM D648
66 psi, Unannealed, 0.126 in	419	--	°F	ASTM D648
66 psi, Unannealed	--	232 to 429	°F	ISO 75-2/B
66 psi, Unannealed, 0.157 in, 3.94 in Span ¹²	419	--	°F	ISO 75-2/Be
66 psi, Unannealed, 0.157 in, 2.52 in Span ¹¹	419	--	°F	ISO 75-2/Bf
66 psi, Annealed	--	310 to 358	°F	ISO 75-2/B
264 psi, Unannealed	--	115 to 417	°F	ASTM D648
264 psi, Unannealed, 0.126 in	383	--	°F	ASTM D648
264 psi, Unannealed	--	121 to 404	°F	ISO 75-2/A
264 psi, Unannealed, 0.157 in, 3.94 in Span ¹²	383	--	°F	ISO 75-2/Ae
264 psi, Unannealed, 0.157 in, 2.52 in Span ¹¹	383	--	°F	ISO 75-2/Af
264 psi, Annealed	--	135 to 172	°F	ISO 75-2/A
1160 psi, Unannealed	--	113	°F	ISO 75-2/C
Continuous Use Temperature				
--	--	247 to 251	°F	ASTM D794
Glass Transition Temperature				
--	--	130 to 143	°F	ISO 11357-2



Thermal	VALOX™ FR Resin 865 - Europe	Generic PBT	Unit	Test Method
Vicat Softening Temperature				
--	--	331 to 428	°F	ASTM D1525
--	428	--	°F	ASTM D1525 ¹³ ISO 306/A50 ¹³
--	392	--	°F	ASTM D1525 ¹⁴
--	--	334 to 433	°F	ISO 306
Ball Pressure Test (253 to 261°F)	Pass	--		IEC 60695-10-2
Melting Temperature				
--	--	431 to 438	°F	
--	--	432 to 437	°F	DSC ASTM D3418
--	--	436 to 438	°F	ISO 11357-3
--	--	410 to 438	°F	ISO 3146
CLTE				
Flow	--	1.6E-5 to 5.2E-5	in/in/°F	ASTM D696
Flow	--	1.1E-5 to 7.8E-5	in/in/°F	ASTM E831
Flow	--	7.8E-6 to 2.5E-4	in/in/°F	ISO 11359-2
Flow : -40 to 104°F	1.1E-5	--	in/in/°F	ISO 11359-2
Flow : 73 to 176°F	1.9E-5	--	in/in/°F	ISO 11359-2
Flow : 73 to 302°F	9.3E-6	--	in/in/°F	ISO 11359-2
Transverse	--	4.2E-5 to 6.5E-5	in/in/°F	ASTM E831
Transverse	--	7.9E-6 to 2.4E-4	in/in/°F	ISO 11359-2
Transverse : -40 to 104°F	3.4E-5	--	in/in/°F	ISO 11359-2
Transverse : 73 to 176°F	5.6E-5	--	in/in/°F	ISO 11359-2
Transverse : 73 to 302°F	8.2E-5	--	in/in/°F	ISO 11359-2
Thermal Conductivity	--	1.7 to 1.9	Btu·in/hr/ft ² /°F	ISO 8302
RTI Elec	230	163 to 284	°F	UL 746B
RTI Imp	230	167 to 284	°F	UL 746B
RTI Str	230	280 to 284	°F	UL 746B
Electrical	VALOX™ FR Resin 865 - Europe	Generic PBT	Unit	Test Method
Surface Resistivity				
--	--	1.0E+3 to 2.5E+15	ohms	ASTM D257
--	> 1.0E+15	1.0E+2 to 2.5E+15	ohms	IEC 60093
--	--	9.8E+14 to 1.0E+15	ohms	IEC 62631-3-2
Volume Resistivity				
--	1.0E+15	2.5 to 2.5E+17	ohms·cm	ASTM D257
--	1.0E+15	13 to 2.5E+17	ohms·cm	IEC 60093
--	--	1.0E+11 to 2.5E+13	ohms·m	IEC 62631-3-1



Electrical	VALOX™ FR Resin 865 - Europe	Generic PBT	Unit	Test Method
Dielectric Strength				
--	--	51 to 650	V/mil	ASTM D149
0.0315 in, in Oil	640	--	V/mil	ASTM D149 IEC 60243-1
0.0630 in, in Oil	530	--	V/mil	ASTM D149
0.126 in, in Oil	380	--	V/mil	ASTM D149 IEC 60243-1
--	--	380 to 780	V/mil	IEC 60243-1
0.0630 in, in Oil	480	--	V/mil	IEC 60243-1
Dielectric Constant				
--	--	2.91 to 3.44		ASTM D150
--	--	3.18 to 4.02		IEC 60250
--	--	3.16		IEC 60250
50 Hz	3.40	--		IEC 60250
60 Hz	3.40	--		IEC 60250
1 MHz	3.30	--		IEC 60250
--	--	3.35		IEC 62631-2-1
Dissipation Factor				
--	--	1.0E-3 to 0.078		ASTM D150
--	--	7.8E-4 to 0.020		IEC 60250
50 Hz	1.0E-3	--		IEC 60250
60 Hz	1.0E-3	--		IEC 60250
1 MHz	0.012	--		IEC 60250
--	--	4.0E-4 to 0.024		IEC 62631-2-1
Arc Resistance				
Arc Resistance	--	69.5 to 180	sec	ASTM D495
Arc Resistance ¹⁵	PLC 6	--		ASTM D495
Comparative Tracking Index (CTI)	PLC 3	--		UL 746A
Comparative Tracking Index				IEC 60112
--	225	587 to 600	V	
Solution B	150	--	V	
High Amp Arc Ignition (HAI) ¹⁶	PLC 3	--		UL 746A
High Voltage Arc Resistance to Ignition (HVAR)	PLC 4	--		UL 746A
Hot-wire Ignition (HWI)	PLC 1	--		UL 746A
Flammability				
Burning Rate	--	0.0 to 3.9	in/min	ISO 3795
Flame Rating				UL 94
0.06 in	V-0	--		
0.12 in	5VA	--		
Glow Wire Flammability Index				
--	--	1370 to 1760	°F	IEC 60695-2-12
0.04 in	1760	--	°F	
Glow Wire Ignition Temperature				
	--	1200 to 1560	°F	IEC 60695-2-13
Oxygen Index				
--	--	19 to 32	%	ASTM D2863
--	31	22 to 30	%	ISO 4589-2



Fill Analysis	VALOX™ FR Resin 865 - Europe	Generic PBT	Unit	Test Method
Melt Density	--	1.04 to 1.11	g/cm ³	
Melt Viscosity				
--	--	90.9 to 219	Pa·s	ASTM D3835
500°F, 1500 sec ⁻¹	145	--	Pa·s	ISO 11443
Melt Specific Heat	--	0.539	Btu/lb/°F	ASTM C351
Melt Thermal Conductivity	--	0.76	Btu·in/hr/ft ² /°F	ASTM C177
Ejection Temperature	--	339	°F	

Additional Information	VALOX™ FR Resin 865 - Europe	Generic PBT	Unit	Test Method
Filler Content	30	--	%	ASTM D229

Injection	VALOX™ FR Resin 865 - Europe	Generic PBT	Unit
Drying Temperature	230 to 248	229 to 249	°F
Drying Time	4.0 to 6.0	2.8 to 6.2	hr
Drying Time, Maximum	--	10	hr
Suggested Max Moisture	0.020	0.020 to 0.043	%
Suggested Shot Size	--	60	%
Hopper Temperature	104 to 140	95 to 123	°F
Rear Temperature	464 to 500	454 to 482	°F
Middle Temperature	491 to 536	454 to 502	°F
Front Temperature	500 to 536	461 to 511	°F
Nozzle Temperature	509 to 527	462 to 502	°F
Processing (Melt) Temp	500 to 545	471 to 511	°F
Mold Temperature	140 to 230	139 to 198	°F
Injection Pressure	--	11200 to 12700	psi
Holding Pressure	--	8490 to 11600	psi
Back Pressure	--	21.3 to 238	psi
Screw Speed	--	45 to 300	rpm
Vent Depth	--	7.5E-4 to 1.2E-3	in

Injection Notes

Generic
PBT

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Extrusion	VALOX™ FR Resin 865 - Europe	Generic PBT	Unit
Drying Temperature	--	230 to 248	°F
Drying Time	--	3.0 to 4.0	hr
Suggested Max Moisture	--	0.040	%
Melt Temperature	--	481 to 505	°F

Extrusion Notes

Generic
PBT

This data represents typical values that have been calculated from all products classified as: Generic PBT

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Notes

¹ A UL Yellow Card contains UL-verified flammability and electrical characteristics. UL Prospector continually works to link Yellow Cards to individual plastic materials in Prospector, however this list may not include all of the appropriate links. It is important that you verify the association between these Yellow Cards and the plastic material found in Prospector. For a complete listing of Yellow Cards, visit the UL Yellow Card Search.

² Typical properties: these are not to be construed as specifications.

³ Tensile Bar

⁴ 0.20 in/min

⁵ Type I, 0.20 in/min

⁶ 0.051 in/min

⁷ 0.079 in/min

⁸ at Break

⁹ 2 mm/min

¹⁰ 80*10*4 sp=62mm

¹¹ 80*10*4 mm

¹² 120*10*4 mm

¹³ Rate A (50°C/h), Loading 1 (10 N)

¹⁴ Rate A (50°C/h), Loading 2 (50 N)

¹⁵ Tungsten Electrode

¹⁶ Surface

