LNP™ ELCRIN™ EXL5689BL

DESCRIPTION

ELCRIN EXL5689BL polycarbonate (PC) resin is a GF reinforced, UV stabilized, flame retardant injection molding copolymer blend with partial component synthesized from bio-source. This medium flow resin features UL94 V0 @ 1.5mm flame retardancy based on non-chlorine, non-bromine FR agents with good processability and improved release performance. ELCRIN EXL5689BL resin offers much improved impact strength and ductility over conventional GF reinforced PC resins. This product is targeted for a broad range of applications, including electrical and electronic enclosures among others.

GENERAL INFORMATION	
Features	Flame Retardant, Chemical Resistance, Sustainable (bio-based offerings), Impact resistant
Fillers	Glass Fiber
Polymer Types	Polycarbonate (PC)
Processing Techniques	Injection Molding

INDUSTRY	SUB INDUSTRY
Building and Construction	Building Component, Water Management
Electrical and Electronics	Mobile Phone - Computer - Tablets, Lighting
Industrial	Electrical, Defense
Mass Transportation	Rail

TYPICAL PROPERTY VALUES

Revision 20231218

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL [1]			
Tensile Stress, yld, Type I, 5 mm/min	55	MPa	ASTM D638
Tensile Stress, brk, Type I, 5 mm/min	44	MPa	ASTM D638
Tensile Strain, yld, Type I, 5 mm/min	4.4	%	ASTM D638
Tensile Strain, brk, Type I, 5 mm/min	15	%	ASTM D638
Tensile Modulus, 5 mm/min	3800	MPa	ASTM D638
Flexural Strength, 1.3 mm/min, 50 mm span	97	MPa	ASTM D790
Flexural Modulus, 1.3 mm/min, 50 mm span	3150	MPa	ASTM D790
Tensile Stress, yield, 5 mm/min	54	MPa	ISO 527
Tensile Stress, break, 5 mm/min	46	MPa	ISO 527
Tensile Strain, yield, 5 mm/min	4.4	%	ISO 527
Tensile Strain, break, 5 mm/min	13	%	ISO 527
Tensile Modulus, 1 mm/min	3600	MPa	ISO 527
Flexural Strength, 2 mm/min	96	MPa	ISO 178
Flexural Modulus, 2 mm/min	3400	MPa	ISO 178
IMPACT [1]			
Izod Impact, notched, 23°C	340	J/m	ASTM D256
Izod Impact, notched, -30°C	150	J/m	ASTM D256
Izod Impact, notched 80*10*3 +23°C	25	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*3 -30°C	10	kJ/m²	ISO 180/1A
Izod Impact, unnotched 80*10*3 +23°C	NB	kJ/m²	ISO 180/1U

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Izod Impact, unnotched 80*10*3 -30°C	NB	kJ/m²	ISO 180/1U
Charpy 23°C, V-notch Edgew 80*10*3 sp=62mm	30	kJ/m²	ISO 179/1eA
Charpy -30°C, V-notch Edgew 80*10*3 sp=62mm	15	kJ/m²	ISO 179/1eA
Charpy 23°C, Unnotch Edgew 80*10*3 sp=62mm	NB	kJ/m²	ISO 179/1eU
Charpy -30°C, Unnotch Edgew 80*10*3 sp=62mm	NB	kJ/m²	ISO 179/1eU
Instrumented Dart Impact Total Energy, 23°C	40	J	ASTM D3763
THERMAL (1)			
HDT/Ae, 1.8 MPa Edgew 120*10*4 sp=100mm	132	°C	ISO 75/Ae
CTE, -40°C to 40°C, flow	4.7E-05	1/°C	ASTM E831
CTE, -40°C to 40°C, xflow	7.E-05	1/°C	ASTM E831
CTE, -40°C to 40°C, flow	4.7E-05	1/°C	ISO 11359-2
CTE, -40°C to 40°C, xflow	7.E-05	1/°C	ISO 11359-2
Vicat Softening Temp, Rate B/50	146	°C	ASTM D1525
Vicat Softening Temp, Rate B/50	145	°C	ISO 306
Vicat Softening Temp, Rate B/120	146	°C	ISO 306
Ball Pressure Test, 125°C +/- 2°C	passes	-	IEC 60695-10-2
Relative Temp Index, Elec (2)	130	°C	UL 746B
Relative Temp Index, Mech w/impact (2)	120	°C	UL 746B
Relative Temp Index, Mech w/o impact (2)	130	°C	UL 746B
PHYSICAL (1)			
Specific Gravity	1.26	-	ASTM D792
Density	1.26	g/cm³	ISO 1183
Melt Flow Rate, 300°C/1.2 kgf	9	g/10 min	ASTM D1238
Melt Volume Rate, MVR at 300°C/1.2 kg	8	cm³/10 min	ISO 1133
Water Absorption, (23°C/saturated)	0.35	%	ISO 62-1
Moisture Absorption (23°C / 50% RH)	0.15	%	ISO 62
Mold Shrinkage, flow, 3.2 mm (3)	0.2 – 0.6	%	SABIC method
ELECTRICAL (1)			
High Voltage Arc Track Rate {PLC} (2)	4	PLC Code	UL 746A
Comparative Tracking Index (UL) {PLC} (2)	3	PLC Code	UL 746A
Volume Resistivity	>1.E+15	Ω.cm	IEC 60093
Dielectric Strength in oil, 1.5mm	27	kV/mm	IEC 60243-1
Comparative Tracking Index	175	V	IEC 60112
Hot-Wire Ignition (HWI), PLC 2 (2)	≥3	mm	UL 746A
Hot-Wire Ignition (HWI), PLC 3 (2)	≥0.75	mm	UL 746A
High Amp Arc Ignition (HAI), PLC 1 (2)	≥1	mm	UL 746A
High Amp Arc Ignition (HAI), PLC 4 (2)	≥0.75	mm	UL 746A
Dielectric Constant, 1.1 GHz	2.95	-	SABIC method
Dissipation Factor, 1.1 GHz	0.0058	-	SABIC method
Dielectric Constant, 1.9 GHz	3	-	SABIC method
Dissipation Factor, 1.9 GHz	0.0062	-	SABIC method
FLAME CHARACTERISTICS (2)			
UL Yellow Card Link	E207780-101033175	-	-
UL Recognized, 94HB Flame Class Rating	≥0.75	mm	UL 94
UL Recognized, 94V-1 Flame Class Rating	≥1.2	mm	UL 94

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
UL Recognized, 94V-0 Flame Class Rating	≥1.5	mm	UL 94
Glow Wire Ignitability Temperature, 3.0 mm	825	°C	IEC 60695-2-13
Glow Wire Ignitability Temperature, 1.5 mm	825	°C	IEC 60695-2-13
Glow Wire Ignitability Temperature, 1.2 mm	825	°C	IEC 60695-2-13
Glow Wire Ignitability Temperature, 1.1 mm	825	°C	IEC 60695-2-13
Glow Wire Ignitability Temperature, 1.0 mm	825	°C	IEC 60695-2-13
Glow Wire Ignitability Temperature, 0.75 mm	825	°C	IEC 60695-2-13
Glow Wire Flammability Index, 3.0 mm	960	°C	IEC 60695-2-12
Glow Wire Flammability Index, 1.5 mm	960	°C	IEC 60695-2-12
Glow Wire Flammability Index, 1.2 mm	960	°C	IEC 60695-2-12
Glow Wire Flammability Index, 1.1 mm	960	°C	IEC 60695-2-12
Glow Wire Flammability Index, 1.0 mm	825	°C	IEC 60695-2-12
Glow Wire Flammability Index, 0.75 mm	825	°C	IEC 60695-2-12
UV-light, water exposure/immersion	f1	-	UL 746C
INJECTION MOLDING [4]			
Drying Temperature	120	°C	
Drying Time	3 – 4	Hrs	
Drying Time (Cumulative)	48	Hrs	
Maximum Moisture Content	0.02	%	
Melt Temperature	270 – 330	°C	
Nozzle Temperature	265 – 325	°C	
Front - Zone 3 Temperature	270 – 330	°C	
Middle - Zone 2 Temperature	260 – 320	°C	
Rear - Zone 1 Temperature	250 – 310	°C	
Mold Temperature	80 – 115	°C	
Back Pressure	0.3 – 0.7	MPa	
Screw Speed	40 – 70	rpm	
Shot to Cylinder Size	40 – 60	%	
Vent Depth	0.025 – 0.076	mm	

(1) The information stated on Technical Datasheets should be used as indicative only for material selection purposes and not be utilized as specification or used for part or tool design.

(2) UL Ratings shown on the technical datasheet might not cover the full range of thicknesses and colors. For details, please see the UL Yellow Card.

(3) Measurements made from laboratory test coupon. Actual shrinkage may vary outside of range due to differences in processing conditions, equipment, part geometry and tool design. It is recommended that mold shrinkage studies be performed with surrogate or legacy tooling prior to cutting tools for new molded article.

(4) Injection Molding parameters are only mentioned as general guidelines. These may not apply or may need adjustment in specific situations such as low shot sizes, large part molding, thin wall molding and gas-assist molding.

DISCLAIMER