NORYL™ Resin SE1GFN2

REGION ASIA

DESCRIPTION

NORYL SE1GFN2 resin is a 20% glass fiber reinforced blend of polyphenylene ether (PPE) + polystyrene (PS). This injection moldable grade contains non-brominated, non-chlorinated flame retardant and carries a UL94 flame rating of 5VA at 2mm and V1 at 1.5mm along with UL746C Outdoor Suitability rating of F1 in some regions and RTI of 110°C. NORYL SE1GFN2 exhibits high heat resistance, good dielectric strength, dimensional stability, hydrolytic stability, and very low moisture absorption. This material is an excellent candidate for a variety of applications such as solar frames, unattended power supply (UPS) inverter/charger, indoor and outdoor electrical enclosures / housings / connectors, and wall plates / sockets / switches.

GENERAL INFORMATION	
Features	Flame Retardant, Hydrolytic Stability, Low Warpage, Amorphous, Low Shrinkage, Low Moisture Absorption, Low Specific Gravity, Non Cl/Br flame retardant, Non halogenated flame retardant, Dimensional stability, High stiffness/Strength, No PFAS intentionally added
Fillers	Glass Fiber (Total fluorine >50ppm only from inorganic fluorine)
Polymer Types	Polyphenylene Ether + PS (PPE+PS)
Processing Techniques	Injection Molding

INDUSTRY	SUB INDUSTRY
Automotive	Automotive EV Batteries
Electrical and Electronics	Energy Management, Mobile Phone - Computer - Tablets
Industrial	Electrical

TYPICAL PROPERTY VALUES

Revision 20261106

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL [1]			
Tensile Stress, brk, Type I, 50 mm/min	120	MPa	ASTM D638
Tensile Strain, brk, Type I, 50 mm/min	3	%	ASTM D638
Tensile Modulus, 5 mm/min	7100	MPa	ASTM D638
Flexural Stress, yld, 1.3 mm/min, 50 mm span	140	MPa	ASTM D790
Flexural Modulus, 1.3 mm/min, 50 mm span	5500	MPa	ASTM D790
Tensile Stress, break, 50 mm/min	100	MPa	ISO 527
Tensile Strain, break, 50 mm/min	2.5	%	ISO 527
Tensile Modulus, 1 mm/min	6400	MPa	ISO 527
Flexural Stress, yield, 2 mm/min	150	MPa	ISO 178
Flexural Modulus, 2 mm/min	5600	MPa	ISO 178
IMPACT [1]			
Izod Impact, Unnotched			
23°C	520	J/m	ASTM D4812
80*10*4 +23°C	28	kJ/m²	ISO 180/1U
80*10*4 -30°C	27	kJ/m²	ISO 180/1U
Izod impact, notched			
23°C	100	J/m	ASTM D256
-30°C	90	J/m	ASTM D256

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PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
80*10*4 +23°C	9	kJ/m²	ISO 180/1A
80*10*4 -30°C	8	kJ/m²	ISO 180/1A
Instrumented Dart Impact Total Energy, 23°C	18	J	ASTM D3763
Charpy Impact, notched, 23°C	7	kJ/m²	ISO 179/2C
THERMAL [1]			
Vicat Softening Temp, Rate B/50	142	°C	ASTM D1525
HDT, 0.45 MPa, 3.2 mm, unannealed	142	°C	ASTM D648
HDT, 1.82 MPa, 3.2mm, unannealed	134	°C	ASTM D648
CTE, -40°C to 40°C, flow	2.5E-05	1/°C	ASTM E831
CTE, -40°C to 40°C, xflow	7.5E-05	1/°C	ASTM E831
CTE, -40°C to 40°C, flow	3.E-05	1/°C	ISO 11359-2
CTE, -40°C to 40°C, xflow	7.5E-05	1/°C	ISO 11359-2
Vicat Softening Temp, Rate B/50	142	°C	ISO 306
Vicat Softening Temp, Rate B/120	144	°C	ISO 306
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	133	°C	ISO 75/Af
Relative Temp Index, Elec [2]	110	°C	UL 746B
Relative Temp Index, Mech w/impact [2]	105	°C	UL 746B
Relative Temp Index, Mech w/o impact [2]	110	°C	UL 746B
PHYSICAL [1]			
Specific Gravity	1.23	-	ASTM D792
Mold Shrinkage, flow, 3.2 mm [3]	0.2 – 0.5	%	SABIC method
Melt Flow Rate, 280°C/5.0 kgf	3.5	g/10 min	ASTM D1238
Water Absorption, (23°C/24hrs)	0.11	%	ISO 62-1
Moisture Absorption, (23°C/50% RH/Equilibrium)	0.04	%	ISO 62-4
Melt Volume Rate, MVR at 280°C/5.0 kg	3	cm³/10 min	ISO 1133
ELECTRICAL [1]			
Volume Resistivity	2.04E+16	Ω.cm	ASTM D257
Surface Resistivity	1.34E+17	Ω	ASTM D257
Dielectric Strength, in oil, 1.6 mm	26.2	kV/mm	ASTM D149
Relative Permittivity, 1 MHz	2.93	-	ASTM D150
Dissipation Factor, 1 MHz	0.0034	-	ASTM D150
Volume Resistivity	2.04E+16	Ω.cm	IEC 60093
Surface Resistivity, ROA	1.34E+17	Ω	IEC 60093
Dielectric Strength in oil, 1.5mm	26.2	kV/mm	IEC 60243-1
Relative Permittivity, 1 MHz	2.9	-	IEC 60250
Dissipation Factor, 1 MHz	0.0034	-	IEC 60250
Comparative Tracking Index (UL) {PLC}	2	PLC Code	UL 746A
High Voltage Arc Track Rate {PLC}	4	PLC Code	UL 746A
High Amp Arc Ignition (HAI), PLC 2	≥1.5	mm	UL 746A
High Amp Arc Ignition (HAI), PLC 4	≥0.4	mm	UL 746A
Hot-Wire Ignition (HWI), PLC 0	≥0.71	mm	UL 746A
Hot-Wire Ignition (HWI), PLC 2	≥0.4	mm	UL 746A
FLAME CHARACTERISTICS [2]			
UL Yellow Card Link	E207780-228590	-	-
UL Yellow Card Link 2	E45587-100036373	-	-

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PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
UL Recognized, 94-5VA Flame Class Rating	≥2.5	mm	UL 94
UL Recognized, 94V-1 Flame Class Rating	≥0.4	mm	UL 94
INJECTION MOLDING [4]			
Drying Temperature	110 – 120	°C	
Drying Time	3 – 4	Hrs	
Drying Time (Cumulative)	8	Hrs	
Maximum Moisture Content	0.02	%	
Melt Temperature	300 – 325	°C	
Nozzle Temperature	300 – 325	°C	
Front - Zone 3 Temperature	290 – 325	°C	
Middle - Zone 2 Temperature	275 – 320	°C	
Rear - Zone 1 Temperature	265 – 315	°C	
Mold Temperature	80 – 110	°C	
Back Pressure	0.3 – 0.7	MPa	
Screw Speed	20 – 100	rpm	
Shot to Cylinder Size	30 – 70	%	

(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, colors and regions. 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.

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