NORYL™ Resin GFN2BIO3

DESCRIPTION

NORYL GFN2BIO3 resin is a 20% glass fiber reinforced blend of polyphenylene ether (PPE) + polystyrene (PS) with bio-based content. This general-purpose injection moldable grade exhibits very low moisture absorption, high strength, hydrolytic stability, Low warpage, low specific gravity, and dimensional stability. NORYL GFN2BIO3 carries a UL746C outdoor suitability rating of F1 and is an excellent candidate for a variety of indoor and outdoor applications including construction, electrical components + displays, lawn and garden equipment. *See NORYL GFN2F resin for FDA food compliant / NSF version.

GENERAL INFORMATION	
Applications	Mobile Phone, Commercial Appliance, Electrical, Electronic Components, Energy Management, Houseware & appliances
Features	Flame Retardant, Hydrolytic Stability, Low Warpage, Amorphous, IR Transparent, Low Moisture Absorption, Bio-Renewable, 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
Building and Construction	Building Component
Consumer	Commercial Appliance
Electrical and Electronics	Electronic Components, Mobile Phone - Computer - Tablets

TYPICAL PROPERTY VALUES

Revision 20231109

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL [1]			
Tensile Stress, break, 50 mm/min	97	MPa	ISO 527
Tensile Strain, break, 50 mm/min	2.5	%	ISO 527
Tensile Modulus, 1 mm/min	7070	MPa	ISO 527
Flexural Modulus, 2 mm/min	6540	MPa	ISO 178
Flexural Stress, yield, 2 mm/min	167	MPa	ISO 178
Tensile Modulus, 50 mm/min	6200	MPa	ASTM D638
Tensile Strain, brk, Type I, 50 mm/min	2.6	%	ASTM D638
Tensile Stress, brk, Type I, 50 mm/min	90	MPa	ASTM D638
Flexural Modulus, 1.3 mm/min, 50 mm span	5800	MPa	ASTM D790
Flexural Stress, yld, 1.3 mm/min, 50 mm span	160	MPa	ASTM D790
Hardness, Rockwell L	106	-	ASTM D785
IMPACT [1]			
Izod Impact, notched 80*10*4 +23°C	11	kJ/m²	ISO 180/1A
Charpy 23°C, V-notch Edgew 80*10*3 sp=62mm	11	kJ/m²	ISO 179/1eA
Izod Impact, notched, 23°C	119	J/m	ASTM D256
Izod Impact, notched, -40°C	96	J/m	ASTM D256
Izod Impact, unnotched, 23°C	650	J/m	ASTM D4812
Instrumented Dart Impact Total Energy, 23°C	22	J	ASTM D3763

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PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
THERMAL [1]			
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	137	°C	ISO 75/Af
HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm	143	°C	ISO 75/Bf
HDT, 1.82 MPa, 3.2mm, unannealed	135	°C	ASTM D648
HDT, 0.45 MPa, 3.2 mm, unannealed	140	°C	ASTM D648
Vicat Softening Temp, Rate B/50	143	°C	ISO 306
Vicat Softening Temp, Rate B/120	146	°C	ISO 306
CTE, -40°C to 40°C, flow	3.3E-05	1/°C	ISO 11359-2
CTE, -40°C to 40°C, xflow	9.0E-05	1/°C	ISO 11359-2
CTE, -40°C to 40°C, flow	3.3E-05	1/°C	ASTM E831
CTE, -40°C to 40°C, xflow	9.0E-05	1/°C	ASTM E831
Relative Temp Index, Elec	90	°C	UL 746B
Relative Temp Index, Mech w/impact	90	°C	UL 746B
Relative Temp Index, Mech w/o impact	90	°C	UL 746B
PHYSICAL [1]			
Mold Shrinkage, flow	0.2 – 0.5	%	SABIC method
Melt Volume Rate, MVR at 300°C/5.0 kg	8	cm³/10 min	ISO 1133
Specific Gravity	1.2	-	ASTM D792
Water Absorption, 23°C/24hrs	0.06	%	SABIC method
Melt Flow Rate, 300°C/5.0 kgf	9	g/10 min	ASTM D1238
ELECTRICAL [1]			
Dielectric Strength, in oil, 3.2 mm	16.5	kV/mm	ASTM D149
Relative Permittivity, 50/60 Hz	2.86	-	ASTM D150
Dissipation Factor, 50/60 Hz	0.0008	-	ASTM D150
Hot-Wire Ignition (HWI), PLC 1	≥6	mm	UL 746A
Hot-Wire Ignition (HWI), PLC 4	≥1.5	mm	UL 746A
High Amp Arc Ignition (HAI), PLC 3	≥6	mm	UL 746A
High Voltage Arc Track Rate {PLC}	4	PLC Code	UL 746A
Arc Resistance, Tungsten {PLC}	7	PLC Code	ASTM D495
High Amp Arc Ignition (HAI), PLC 4	≥1.5	mm	UL 746A
FLAME CHARACTERISTICS [2]			
UL Yellow Card Link [2]	E121562-221161	-	-
UL Recognized, 94HB Flame Class Rating	≥1.5	mm	UL 94
UV-light, water exposure/immersion	F1	-	UL 746C
Oxygen Index (LOI)	26	%	ASTM D2863
INJECTION MOLDING [3]			
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	
Rear - Zone 1 Temperature	265 – 315	°C	
Middle - Zone 2 Temperature	275 – 320	°C	
Front - Zone 3 Temperature	290 – 325	°C	
Nozzle Temperature	300 – 325	°C	

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PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
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 and colors. For details, please see the UL Yellow Card.

(3) 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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