NORYL™ Resin GFN3

REGION AMERICAS

DESCRIPTION

NORYL GFN3 resin is a 30% glass fiber reinforced blend of polyphenylene ether (PPE) + polystyrene (PS). This general-purpose injection moldable grade exhibits very low moisture absorption, high strength, hydrolytic stability, Low warpage, low specific gravity, and dimensional stability. NORYL GFN3 carries a UL746C outdoor suitability rating of F2 and is an excellent candidate for a variety of indoor and outdoor applications including construction, electrical components + displays, lawn and garden equipment. *See NORYL GFN3F resin for FDA food compliant / NSF version.

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
Building and Construction	Building Component
Consumer	Commercial Appliance
Electrical and Electronics	Electronic Components, Mobile Phone - Computer - Tablets

TYPICAL PROPERTY VALUES

Revision 20241016

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL [1]			
Tensile Stress, brk, Type I, 5 mm/min	116	MPa	ASTM D638
Tensile Strain, brk, Type I, 5 mm/min	2	%	ASTM D638
Tensile Modulus, 5 mm/min	9150	MPa	ASTM D638
Flexural Stress, yld, 1.3 mm/min, 50 mm span	180	MPa	ASTM D790
Flexural Stress, yld, 2.6 mm/min, 100 mm span	162	MPa	ASTM D790
Flexural Modulus, 1.3 mm/min, 50 mm span	8000	MPa	ASTM D790
Flexural Modulus, 2.6 mm/min, 100 mm span	7170	MPa	ASTM D790
Hardness, Rockwell L	108	-	ASTM D785
Tensile Stress, break	117	MPa	ISO 527
Tensile Strain, break	1.8	%	ISO 527
Tensile Modulus, 1 mm/min	8740	MPa	ISO 527
Flexural Stress	183	MPa	ISO 178
Flexural Modulus	8710	MPa	ISO 178
IMPACT [1]			
Izod Impact, unnotched, 23°C	588	J/m	ASTM D4812
Izod Impact, notched, 23°C	117	J/m	ASTM D256
Izod Impact, notched, -30°C	124	J/m	ASTM D256
Izod Impact, unnotched 80*10*4 +23°C	31	kJ/m²	ISO 180/1U
Izod Impact, unnotched 80*10*4 -30°C	35	kJ/m²	ISO 180/1U

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PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Izod Impact, notched 80*10*4 +23°C	12	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	11	kJ/m²	ISO 180/1A
Charpy Impact, notched, 23°C	12	kJ/m²	ISO 179/2C
Charpy Impact, notched, -30°C	11	kJ/m²	ISO 179/2C
Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm	39	kJ/m²	ISO 179/1eU
Charpy -30°C, Unnotch Edgew 80*10*4 sp=62mm	47	kJ/m²	ISO 179/1eU
THERMAL [1]			
HDT, 0.45 MPa, 3.2 mm, unannealed	142	°C	ASTM D648
HDT, 1.82 MPa, 3.2mm, unannealed	137	°C	ASTM D648
HDT, 0.45 MPa, 6.4 mm, unannealed	158	°C	ASTM D648
HDT, 1.82 MPa, 6.4 mm, unannealed	137	°C	ASTM D648
CTE, -40°C to 40°C, flow	3.06E-05	1/°C	ASTM E831
CTE, -40°C to 40°C, xflow	6.18E-05	1/°C	ASTM E831
Vicat Softening Temp, Rate B/50	143	°C	ISO 306
Vicat Softening Temp, Rate B/120	147	°C	ISO 306
HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm	143	°C	ISO 75/Bf
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	137	°C	ISO 75/Af
Relative Temp Index, Elec [2]	90	°C	UL 746B
Relative Temp Index, Mech w/impact [2]	90	°C	UL 746B
Relative Temp Index, Mech w/o impact [2]	90	°C	UL 746B
PHYSICAL [1]			
Specific Gravity	1.29	-	ASTM D792
Water Absorption, (23°C/24hrs)	0.06	%	ASTM D570
Mold Shrinkage, flow, 3.2 mm [3]	0.1 – 0.4	%	SABIC method
Melt Flow Rate, 300°C/5.0 kgf	8.6	g/10 min	ASTM D1238
Melt Volume Rate, MVR at 300°C/5.0 kg	7	cm³/10 min	ISO 1133
ELECTRICAL [1]			
Dielectric Strength, in oil, 3.2 mm	21.6	kV/mm	ASTM D149
Relative Permittivity, 50/60 Hz	2.93	-	ASTM D150
Dissipation Factor, 50/60 Hz	0.0009	-	ASTM D150
High Voltage Arc Track Rate {PLC}	3	PLC Code	UL 746A
Comparative Tracking Index (UL) {PLC}	4	PLC Code	UL 746A
High Amp Arc Ignition (HAI), PLC 4	≥1.5	mm	UL 746A
Hot-Wire Ignition (HWI), PLC 1	≥6	mm	UL 746A
Hot-Wire Ignition (HWI), PLC 4	≥3	mm	UL 746A
Hot-Wire Ignition (HWI), PLC 5	≥1.5	mm	UL 746A
Arc Resistance, Tungsten {PLC}	7	PLC Code	ASTM D495
FLAME CHARACTERISTICS [2]			
UL Yellow Card Link	E121562-221162	-	-
UL Recognized, 94HB Flame Class Rating [2]	≥1.5	mm	UL 94
UV-light, water exposure/immersion	F2	-	UL 746C
Oxygen Index (LOI)	26	%	ASTM D2863
INJECTION MOLDING [4]			
Drying Temperature	110 – 120	°C	
Drying Time	3 – 4	Hrs	

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PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
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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