NORYL™ RESIN GFN1

REGION AMERICAS

DESCRIPTION

NORYL GFN1 resin is a 10% 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 GFN1 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 GFN1F resin for FDA food compliant / NSF version.

GENERAL INFORMATION	
Features	Flame Retardant, Hydrolytic Stability, Low Warpage, Non-Brominated, Non-Chlorinated, Non-Halogenated, Good Stiffness, Good dimensional stability, High Stiffness, High Strength, Amorphous, Low Shrinkage, Low Moisture Absorption, Low Specific Gravity
Fillers	Glass Fiber
Polymer Types	Polyphenylene Ether + PS (PPE+PS)
Processing Techniques	Injection Molding

INDUSTRY	SUB INDUSTRY
Building and Construction	Outdoor, Lawn and Landscape, Construction
Consumer	Commercial Appliance
Electrical and Electronics	Electrical Devices and Displays, Electronic Components

TYPICAL PROPERTY VALUES

Revision 20211027

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL [1]			
Tensile Stress, brk, Type I, 5 mm/min	63	MPa	ASTM D638
Tensile Strain, brk, Type I, 5 mm/min	3	%	ASTM D638
Tensile Modulus, 5 mm/min	4350	MPa	ASTM D638
Flexural Stress, yld, 1.3 mm/min, 50 mm span	116	MPa	ASTM D790
Flexural Stress, yld, 2.6 mm/min, 100 mm span	107	MPa	ASTM D790
Flexural Modulus, 1.3 mm/min, 50 mm span	3840	MPa	ASTM D790
Flexural Modulus, 2.6 mm/min, 100 mm span	3580	MPa	ASTM D790
Hardness, Rockwell L	104	-	ASTM D785
Tensile Stress, break	64	MPa	ISO 527
Tensile Strain, break	3	%	ISO 527
Tensile Modulus, 1 mm/min	4400	MPa	ISO 527
Flexural Stress	122	MPa	ISO 178
Flexural Modulus	4160	MPa	ISO 178
IMPACT [1]			
Izod Impact, unnotched, 23°C	449	J/m	ASTM D4812
Izod Impact, notched, 23°C	118	J/m	ASTM D256
Izod Impact, notched, -30°C	103	J/m	ASTM D256
Instrumented Dart Impact Total Energy, 23°C	21	J	ASTM D3763
Izod Impact, unnotched 80*10*4 +23°C	27	kJ/m²	ISO 180/1U

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Izod Impact, unnotched 80*10*4 -30°C	25	kJ/m²	ISO 180/1U
Izod Impact, notched 80*10*4 +23°C	10	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	9	kJ/m²	ISO 180/1A
Charpy Impact, notched, 23°C	11	kJ/m²	ISO 179/2C
Charpy Impact, notched, -30°C	9	kJ/m²	ISO 179/2C
Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm	34	kJ/m²	ISO 179/1eU
Charpy -30°C, Unnotch Edgew 80*10*4 sp=62mm	33	kJ/m²	ISO 179/1eU
THERMAL [1]			
HDT, 0.45 MPa, 3.2 mm, unannealed	131	°C	ASTM D648
HDT, 1.82 MPa, 3.2mm, unannealed	122	°C	ASTM D648
HDT, 1.82 MPa, 6.4 mm, unannealed	125	°C	ASTM D648
CTE, -40°C to 40°C, flow	5.12E-05	1/°C	ASTM E831
CTE, -40°C to 40°C, xflow	7.14E-05	1/°C	ASTM E831
Vicat Softening Temp, Rate B/50	131	°C	ISO 306
Vicat Softening Temp, Rate B/120	134	°C	ISO 306
HDT/Be, 0.45MPa Edgew 120*10*4 sp=100mm	132	°C	ISO 75/Be
HDT/Ae, 1.8 MPa Edgew 120*10*4 sp=100mm	124	°C	ISO 75/Ae
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	1.13	-	ASTM D792
Water Absorption, (23°C/24hrs)	0.06	%	ASTM D570
Mold Shrinkage, flow, 3.2 mm [3]	0.2 – 0.5	%	SABIC method
Melt Flow Rate, 300°C/5.0 kgf	16.6	g/10 min	ASTM D1238
Melt Volume Rate, MVR at 300°C/5.0 kg	16	cm³/10 min	ISO 1133
ELECTRICAL [1]			
Relative Permittivity, 1 MHz	2.9	-	ASTM D150
Dissipation Factor, 1 MHz	0.0014	-	ASTM D150
High Voltage Arc Track Rate {PLC}	4	PLC Code	UL 746A
High Amp Arc Ignition (HAI), PLC 4	≥1.5	mm	UL 746A
Hot-Wire Ignition (HWI), PLC 4	≥1.5	mm	UL 746A
Hot-Wire Ignition (HWI), PLC 5	≥3	mm	UL 746A
Arc Resistance, Tungsten {PLC}	7	PLC Code	ASTM D495
FLAME CHARACTERISTICS [2]			
UL Yellow Card Link	E121562-221234	-	-
UL Recognized, 94HB Flame Class Rating	≥1.5	mm	UL 94
UV-light, water exposure/immersion	F1	-	UL 746C
INJECTION MOLDING [4]			
Drying Temperature	105 – 110	°C	
Drying Time	3 – 4	Hrs	
Drying Time (Cumulative)	8	Hrs	
Maximum Moisture Content	0.02	%	
Melt Temperature	295 – 315	°C	
Nozzle Temperature	295 – 315	°C	

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Front - Zone 3 Temperature	280 – 315	°C	
Middle - Zone 2 Temperature	270 – 310	°C	
Rear - Zone 1 Temperature	260 – 305	°C	
Mold Temperature	75 – 105	°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) 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