NORYL™ RESIN NHP6024

DESCRIPTION

NORYL NHP6024 resin is a 20% glass reinforced blend of polyphenylene ether (PPE) + polystyrene (PS). This injection moldable grade contains non-brominated, non-chlorinated flame retardant UL94 flame rating of V0 at 1.5mm. NORYL NHP6024 is based on a unique co-polymer technology and exhibits high flow, high impact resistance, dimensional stability, hydrolytic stability, strong electrical performance, very low moisture absorption and specific gravity. The target applications are electrical components, electric vehicle (EV) battery modules and energy storage.

GENERAL INFORMATION	
Features	Good Processability, High Flow, Hydrolytic Stability, Low Warpage, Amorphous, Low Shrinkage, Low Moisture Absorption, Low Specific Gravity, Non Cl/Br flame retardant, Dimensional stability, High stiffness/Strength, High temperature resistance, Impact resistant
Fillers	Glass Fiber
Polymer Types	Polyphenylene Ether + PS (PPE+PS)
Processing Techniques	Injection Molding

INDUSTRY	SUB INDUSTRY
Electrical and Electronics	Electrical Components and Infrastructure
Hydrocarbon and Energy	Electric Vehicle, Energy Storage

TYPICAL PROPERTY VALUES

Revision 20241127

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL [1]			
Tensile Stress, yld, Type I, 5 mm/min	113	MPa	ASTM D638
Tensile Stress, brk, Type I, 5 mm/min	110	MPa	ASTM D638
Tensile Strain, yld, Type I, 5 mm/min	2	%	ASTM D638
Tensile Strain, brk, Type I, 5 mm/min	2	%	ASTM D638
Tensile Modulus, 5 mm/min	6600	MPa	ASTM D638
Flexural Strength, 1.3 mm/min, 50 mm span	155	MPa	ASTM D790
Flexural Modulus, 1.3 mm/min, 50 mm span	6080	MPa	ASTM D790
Tensile Stress, yield, 5 mm/min	110	MPa	ISO 527
Tensile Stress, break, 5 mm/min	100	MPa	ISO 527
Tensile Strain, yield, 5 mm/min	2	%	ISO 527
Tensile Strain, break, 5 mm/min	2	%	ISO 527
Tensile Modulus, 1 mm/min	6530	MPa	ISO 527
Flexural Strength, 2 mm/min	160	MPa	ISO 178
Flexural Modulus, 2 mm/min	6270	MPa	ISO 178
IMPACT [1]			
Izod Impact, notched, 23°C	100	J/m	ASTM D256
Izod Impact, unnotched, 23°C	480	J/m	ASTM D4812
Izod Impact, notched 80*10*4 +23°C	9	kJ/m²	ISO 180/1A
Izod Impact, unnotched 80*10*4 +23°C	32	kJ/m²	ISO 180/1U
Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm	10	kJ/m²	ISO 179/1eA
Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm	34	kJ/m²	ISO 179/1eU

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
THERMAL [1]			
HDT, 0.45 MPa, 3.2 mm, unannealed	138	°C	ASTM D648
HDT, 1.82 MPa, 3.2mm, unannealed	126	°C	ASTM D648
HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm	134	°C	ISO 75/Bf
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	127	°C	ISO 75/Af
CTE			
-40°C to 120°C, flow	2.1E-05	1/°C	ASTM D648
-40°C to 120°C, xflow	7.7E-05	1/°C	ASTM D648
-40°C to 120°C, flow	2.1E-05	1/°C	ISO 11359-2
-40°C to 120°C, xflow	7.7E-05	1/°C	ISO 11359-2
Vicat Softening Temp, Rate B/50	137	°C	ASTM D1525
Vicat Softening Temp, Rate B/120	142	°C	ASTM D1525
Vicat Softening Temp, Rate B/50	135	°C	ISO 306
Vicat Softening Temp, Rate B/120	139	°C	ISO 306
Relative Temp Index, Elec [2]	65	°C	UL 746B
Relative Temp Index, Mech w/impact [2]	65	°C	UL 746B
Relative Temp Index, Mech w/o impact [2]	65	°C	UL 746B
PHYSICAL [1]			
Specific Gravity	1.24	-	ASTM D792
Density	1.24	g/cm³	ISO 1183
Melt Flow Rate, 300°C/5.0 kgf	26	g/10 min	ASTM D1238
Melt Volume Rate, MVR at 280°C/10.0 kg	30	cm³/10 min	ISO 1133
Water Absorption, (23°C/24hrs)	0.07	%	ISO 62-1
Moisture Absorption, (23°C/50% RH/24hrs)	0.03	%	ISO 62-4
Mold Shrinkage, flow [3]	0.25 – 0.35	%	SABIC method
Mold Shrinkage, xflow [3]	0.60 – 0.70	%	SABIC method
ELECTRICAL [1]			
Surface Resistivity	4.0E+16	Ω	ASTM D257
Volume Resistivity	1.9E+17	Ω.cm	ASTM D257
Dielectric Strength, in oil, 2.0 mm	26.8	kV/mm	IEC 60243-1
FLAME CHARACTERISTICS [2]			
UL Yellow Card Link	E207780-104631195	-	-
UL Recognized, 94V-0 Flame Class Rating	≥1.5	mm	UL 94
UL Recognized, 94-5VA Flame Class Rating	≥2.5	mm	UL 94
INJECTION MOLDING [4]			
Drying Temperature	105 – 110	°C	
Drying Time	3 – 4	Hrs	
Maximum Moisture Content	0.02	%	
Melt Temperature	280 – 310	°C	
Nozzle Temperature	280 – 310	°C	
Front - Zone 3 Temperature	270 – 310	°C	
Middle - Zone 2 Temperature	260 – 305	°C	
Rear - Zone 1 Temperature	250 – 300	°C	
Mold Temperature	75 – 105	°C	
Back Pressure	0.3 – 0.7	MPa	

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
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