NORYL™ Resin NHP6046T3

DESCRIPTION

NORYL NHP6046T3 resin is a 30% 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 V0 at 0.3mm for thin-wall molding capability. NHP6046T3 is based on a unique co-polymer technology and exhibits good dimensional stability, high heat resistance, strong electrical performance and very low specific gravity. Target application is Electric Vehicle (EV) battery internal parts and electric components.

GENERAL INFORMATION	
Features	Good Processability, 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, 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	Electronic Components
Hydrocarbon and Energy	Energy Storage

TYPICAL PROPERTY VALUES

Revision 20241022

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL [1]			
Tensile Stress, brk, Type I, 5 mm/min	126	MPa	ASTM D638
Tensile Strain, brk, Type I, 5 mm/min	2.1	%	ASTM D638
Tensile Modulus, 5 mm/min	8638	MPa	ASTM D638
Flexural Strength, 1.3 mm/min, 50 mm span	185	MPa	ASTM D790
Flexural Modulus, 1.3 mm/min, 50 mm span	8700	MPa	ASTM D790
Tensile Stress, break, 5 mm/min	131	MPa	ISO 527
Tensile Strain, break, 5 mm/min	2	%	ISO 527
Tensile Modulus, 1 mm/min	10184	MPa	ISO 527
Flexural Strength, 2 mm/min	178	MPa	ISO 178
Flexural Modulus, 2 mm/min	8478	MPa	ISO 178
IMPACT [1]			
Izod Impact, notched, 23°C	121	J/m	ASTM D256
Izod Impact, notched, -30°C	89	J/m	ASTM D256
Izod Impact, unnotched, 23°C	383	J/m	ASTM D4812
Izod Impact, unnotched, -30°C	553	J/m	ASTM D4812
Izod Impact, notched 80*10*4 +23°C	11	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	10	kJ/m²	ISO 180/1A
Izod Impact, unnotched 80*10*4 +23°C	35.9	kJ/m²	ISO 180/1U
Izod Impact, unnotched 80*10*4 -30°C	40.7	kJ/m²	ISO 180/1U

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PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
THERMAL [1]			
HDT, 0.45 MPa, 3.2 mm, unannealed	125	°C	ASTM D648
HDT, 1.82 MPa, 3.2mm, unannealed	115	°C	ASTM D648
HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm	126	°C	ISO 75/Bf
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	117	°C	ISO 75/Af
CTE, -40°C to 40°C, flow	2.2E-05	1/°C	ASTM E831
CTE, -40°C to 40°C, xflow	6.9E-05	1/°C	ASTM E831
Vicat Softening Temp, Rate A/50	140	°C	ISO 306
Vicat Softening Temp, Rate B/50	129	°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]			
Density	1.37	g/cm³	ISO 1183
Melt Flow Rate, 280°C/5.0 kgf	15	g/10 min	ASTM D1238
Melt Flow Rate, 300°C/5.0 kgf	44	g/10 min	ASTM D1238
Melt Volume Rate, MVR at 280°C/5.0 kg	12	cm³/10 min	ISO 1133
Melt Volume Rate, MVR at 300°C/5.0 kg	25	cm³/10 min	ISO 1133
Moisture Absorption, (23°C/50% RH/24hrs)	0.02	%	ISO 62-4
Mold Shrinkage, flow [3]	0.24	%	SABIC method
Mold Shrinkage, xflow [3]	0.58	%	SABIC method
ELECTRICAL [1]			
Surface Resistivity	5.7E+16	Ω	ASTM D257
Volume Resistivity	1.09E+16	Ω.cm	ASTM D257
FLAME CHARACTERISTICS [2]			
UL Yellow Card Link	E207780-104660813	-	-
UL Recognized, 94V-0 Flame Class Rating	≥0.3	mm	UL 94
UL Recognized, 94-5VA Flame Class Rating	≥2.0	mm	UL 94
INJECTION MOLDING [4]			
Drying Temperature	100 – 120	°C	
Drying Time	3 – 5	Hrs	
Melt Temperature	275 – 330	°C	
Nozzle Temperature	250 – 330	°C	
Front - Zone 3 Temperature	275 – 330	°C	
Middle - Zone 2 Temperature	275 – 330	°C	
Rear - Zone 1 Temperature	275 – 330	°C	
Mold Temperature	70 – 140	°C	

(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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