NORYL™ RESIN NHP7020T3

DESCRIPTION

NORYL NHP7020T3 resin is a non-reinforced blend of polyphenylene ether (PPE) + polystyrene (PS) designed for ultra-thin-wall FR. This injection moldable grade contains non-brominated, non-chlorinated flame retardant and carries UL94 flame rating of V0 at 0.3mm. NORYL NHP7020T3 is based on a unique co-polymer technology and exhibits high impact, high heat resistance, dimensional stability, hydrolytic stability, strong electrical performance, low moisture absorption and low specific gravity. This grade is targeted for electrical vehicle (EV) battery modules, bus bar insulation layer and other high voltage electric component. See NHP8010VT3 resin for higher heat version.

GENERAL INFORMATION	
Features	Flame Retardant, Good Processability, Heat Stabilized, Hydrolytic Stability, Low Warpage, Amorphous, Low Shrinkage, Low Moisture Absorption, Low Specific Gravity, Non Cl/Br flame retardant, Non halogenated flame retardant, Dimensional stability, Impact resistant
Fillers	Unreinforced
Polymer Types	Polyphenylene Ether + PS (PPE+PS)
Processing Techniques	Injection Molding

INDUSTRY	SUB INDUSTRY
Automotive	Automotive EV Batteries
Industrial	Electrical

TYPICAL PROPERTY VALUES

Revision 20231109

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL [1]			
Tensile Stress, yld, Type I, 5 mm/min	61	MPa	ASTM D638
Tensile Stress, brk, Type I, 5 mm/min	48	MPa	ASTM D638
Tensile Strain, yld, Type I, 5 mm/min	5.5	%	ASTM D638
Tensile Strain, brk, Type I, 5 mm/min	20	%	ASTM D638
Tensile Modulus, 5 mm/min	2191	MPa	ASTM D638
Flexural Strength, 1.3 mm/min, 50 mm span	97	MPa	ASTM D790
Flexural Modulus, 1.3 mm/min, 50 mm span	2220	MPa	ASTM D790
Tensile Stress, yield, 5 mm/min	64	MPa	ISO 527
Tensile Stress, break, 5 mm/min	52	MPa	ISO 527
Tensile Strain, yield, 5 mm/min	5.3	%	ISO 527
Tensile Strain, break, 5 mm/min	27	%	ISO 527
Tensile Modulus, 1 mm/min	2245	MPa	ISO 527
Flexural Strength, 2 mm/min	98	MPa	ISO 178
Flexural Modulus, 2 mm/min	2336	MPa	ISO 178
IMPACT [1]			
Izod Impact, notched, 23°C	383	J/m	ASTM D256
Izod Impact, notched, -30°C	101	J/m	ASTM D256
Izod Impact, unnotched, 23°C	2150	J/m	ASTM D4812
Izod Impact, unnotched, -30°C	1550	J/m	ASTM D4812
Izod Impact, notched 80*10*4 +23°C	37.5	kJ/m²	ISO 180/1A

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Izod Impact, notched 80*10*4 -30°C	11.4	kJ/m²	ISO 180/1A
Izod Impact, unnotched 80*10*4 +23°C	104	kJ/m²	ISO 180/1U
Izod Impact, unnotched 80*10*4 -30°C	108	kJ/m²	ISO 180/1U
THERMAL [1]			
HDT, 0.45 MPa, 3.2 mm, unannealed	145	°C	ASTM D648
HDT, 1.82 MPa, 3.2mm, unannealed	128	°C	ASTM D648
HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm	144	°C	ISO 75/Bf
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	125	°C	ISO 75/Af
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	1.09	g/cm³	ISO 1183
Moisture Absorption, (23°C/50% RH/24hrs)	0.043	%	ISO 62-4
Melt Flow Rate, 300°C/5.0 kgf	26	g/10 min	ASTM D1238
Mold Shrinkage, flow [3]	0.75	%	SABIC method
Mold Shrinkage, xflow [3]	0.86	%	SABIC method
ELECTRICAL [1]			
Surface Resistivity	7.6E+16	Ω	ASTM D257
Volume Resistivity	2.2E+16	Ω.cm	ASTM D257
FLAME CHARACTERISTICS [2]			
UL Yellow Card Link	E207780-104613766	-	-
UL Recognized, 94V-0 Flame Class Rating	≥0.3	mm	UL 94
INJECTION MOLDING [4]			
Drying Temperature	100 – 120	°C	
Drying Time	3 – 5	Hrs	
Melt Temperature	280 – 320	°C	
Nozzle Temperature	250 – 320	°C	
Front - Zone 3 Temperature	280 – 320	°C	
Middle - Zone 2 Temperature	280 – 320	°C	
Rear - Zone 1 Temperature	280 – 320	°C	
Mold Temperature	75 – 130	°C	
Back Pressure	0.3 – 0.8	MPa	
Screw Speed	20 – 100	rpm	

(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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