NORYL™ RESIN NHP8010T3

DESCRIPTION

NORYL NHP8010T3 resin is a non-reinforced blend of polyphenylene ether (PPE) + polystyrene (PS) designed for high heat resistance and ultra-thin-wall FR. This extrusion and injection moldable grade contains non-brominated, non-chlorinated flame retardant and carries UL94 flame rating of V0 at 0.3mm. NORYL NHP8010T3 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 pack insulation sheet/film, bus bar insulation layer and other high voltage electric component. See NHP8000VT3 resin for V0 at 0.25mm and CTI 600V/PLC 0 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, High temperature resistance, Impact resistant
Fillers	Unreinforced
Brands	NORYL™
Polymer Types	Polyphenylene Ether + PS (PPE+PS)
Processing Techniques	Injection Molding, Extrusion, Thermoforming

INDUSTRY	SUB INDUSTRY
Automotive	Automotive EV
Hydrocarbon and Energy	Energy Storage

TYPICAL PROPERTY VALUES

Revision 20231109

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL [1]			
Tensile Stress, yld, Type I, 5 mm/min	62	MPa	ASTM D638
Tensile Stress, brk, Type I, 5 mm/min	49	MPa	ASTM D638
Tensile Strain, yld, Type I, 5 mm/min	4.2	%	ASTM D638
Tensile Strain, brk, Type I, 5 mm/min	10.6	%	ASTM D638
Tensile Modulus, 5 mm/min	2382	MPa	ASTM D638
Flexural Stress at 5% strain, 1.3 mm/min, 50 mm span	102	MPa	ASTM D790
Flexural Stress, yld, 1.3 mm/min, 50 mm span	106	MPa	ASTM D790
Flexural Stress, brk, 1.3 mm/min, 50 mm span	104	MPa	ASTM D790
Flexural Modulus, 1.3 mm/min, 50 mm span	2470	MPa	ASTM D790
Tensile Stress, yield, 5 mm/min	63	MPa	ISO 527
Tensile Stress, break, 5 mm/min	50	MPa	ISO 527
Tensile Strain, yield, 5 mm/min	4.2	%	ISO 527
Tensile Strain, break, 5 mm/min	35.6	%	ISO 527
Tensile Modulus, 1 mm/min	2436	MPa	ISO 527
Flexural Strength, 2 mm/min	106	MPa	ISO 178
Flexural Modulus, 2 mm/min	2452	MPa	ISO 178
IMPACT [1]			
Izod Impact, notched, 23°C	326	J/m	ASTM D256
Izod Impact, notched, -40°C	103	J/m	ASTM D256

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Izod Impact, unnotched, 23°C	2190	J/m	ASTM D4812
Izod Impact, unnotched, -40°C	1750	J/m	ASTM D4812
Izod Impact, notched 80*10*4 +23°C	25	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 -40°C	11	kJ/m²	ISO 180/1A
Izod Impact, unnotched 80*10*4 +23°C	NB	kJ/m²	ISO 180/1U
Izod Impact, unnotched 80*10*4 -40°C	NB	kJ/m²	ISO 180/1U
THERMAL [1]			
HDT, 0.45 MPa, 3.2 mm, unannealed	149	°C	ASTM D648
HDT, 1.82 MPa, 3.2mm, unannealed	132	°C	ASTM D648
HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm	149	°C	ISO 75/Bf
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	134	°C	ISO 75/Af
Vicat Softening Temp, Rate A/50	163	°C	ASTM D1525
Vicat Softening Temp, Rate A/120	165	°C	ASTM D1525
PHYSICAL [1]			
Density	1.09	g/cm³	ISO 1183
Moisture Absorption, (23°C/50% RH/24hrs)	0.04	%	ISO 62-4
Melt Flow Rate, 300°C/5.0 kgf	15.7	g/10 min	ASTM D1238
Mold Shrinkage, flow [2]	0.77	%	SABIC method
Mold Shrinkage, xflow [2]	0.76	%	SABIC method
ELECTRICAL [1]			
Surface Resistivity	6.60E+16	Ω	ASTM D257
Volume Resistivity	4.64E+16	Ω.cm	ASTM D257
FLAME CHARACTERISTICS [3]			
UL Yellow Card Link	E207780-104566752	-	-
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	70 – 120	°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) 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.

(3) 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.

(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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