NORYL™ Resin NH5120BIO4

DESCRIPTION

NORYL NH5120BIO4 resin is a non-reinforced blend of polyphenylene ether (PPE) + polystyrene (PS) with bio-based content. This injection moldable grade contains non-brominated, non-chlorinated flame retardant and carries a UL94 flame rating of V1 at 1.5mm. NORYL NH5120BIO4 resin offers a good balance of heat, flow, hydrolytic stability, low creep and dimensional stability along with mechanical property retention in tough outdoor environments. This material is targeted for outdoor housings / enclosures, HVAC components, and photovoltaic / solar junction box applications.

GENERAL INFORMATION	
Applications	Mobile Phone, Commercial Appliance, Electrical, Electronic Components, Energy Management, Houseware & appliances
Features	Flame Retardant, Hydrolytic Stability, Low Warpage, Amorphous, Low Shrinkage, Low Moisture Absorption, Low Specific Gravity, Bio-Renewable, Non Cl/Br flame retardant, Non halogenated flame retardant, Dimensional stability, No PFAS intentionally added
Fillers	Unreinforced
Polymer Types	Polyphenylene Ether + PS (PPE+PS)
Processing Techniques	Injection Molding

INDUSTRY	SUB INDUSTRY
Consumer	Home Appliances, Commercial Appliance
Electrical and Electronics	Energy Management, Electronic Components, Mobile Phone - Computer - Tablets
Hygiene and Healthcare	Patient Testing
Industrial	Electrical

TYPICAL PROPERTY VALUES

Revision 20231109

PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
MECHANICAL [1]			
Tensile Stress, yield, 50 mm/min	65	MPa	ISO 527
Tensile Stress, break, 50 mm/min	57	MPa	ISO 527
Tensile Strain, yield, 50 mm/min	4.4	%	ISO 527
Tensile Strain, break, 50 mm/min	9.2	%	ISO 527
Tensile Modulus, 1 mm/min	2650	MPa	ISO 527
Flexural Modulus, 2 mm/min	2610	MPa	ISO 178
Flexural Stress, yield, 2 mm/min	105	MPa	ISO 178
Tensile Modulus, 50 mm/min	2610	MPa	ASTM D638
Tensile Strain, brk, Type I, 50 mm/min	4.5	%	ASTM D638
Tensile Stress, brk, Type I, 50 mm/min	52	MPa	ASTM D638
Tensile Stress, yld, Type I, 50 mm/min	66	MPa	ASTM D638
Flexural Modulus, 1.3 mm/min, 50 mm span	2680	MPa	ASTM D790
Flexural Stress, yld, 1.3 mm/min, 50 mm span	105	MPa	ASTM D790
IMPACT [1]			
Izod Impact, notched 80*10*4 +23°C	15	kJ/m²	ISO 180/1A
Izod Impact, notched 80*10*4 -30°C	12	kJ/m²	ISO 180/1A
Charpy 23°C, V-notch Edgew 80*10*3 sp=62mm	17	kJ/m²	ISO 179/1eA

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PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Izod Impact, notched, 23°C	186	J/m	ASTM D256
Izod Impact, notched, -30°C	111	J/m	ASTM D256
Instrumented Dart Impact Total Energy, 23°C	53	J	ASTM D3763
THERMAL [1]			
HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm	118	°C	ISO 75/Af
HDT, 1.82 MPa, 3.2mm, unannealed	116	°C	ASTM D648
HDT, 0.45 MPa, 3.2 mm, unannealed	131	°C	ASTM D648
Vicat Softening Temp, Rate B/50	136	°C	ISO 306
Vicat Softening Temp, Rate B/120	138	°C	ISO 306
Vicat Softening Temp, Rate B/50	136	°C	ASTM D1525
CTE, -40°C to 40°C, flow	8.1E-05	1/°C	ISO 11359-2
CTE, -40°C to 40°C, xflow	7.7E-05	1/°C	ISO 11359-2
CTE, -40°C to 40°C, flow	8.1E-05	1/°C	ASTM E831
CTE, -40°C to 40°C, xflow	7.7E-05	1/°C	ASTM E831
Relative Temp Index, Elec	110	°C	UL 746B
Relative Temp Index, Mech w/impact	105	°C	UL 746B
Relative Temp Index, Mech w/o impact	110	°C	UL 746B
PHYSICAL [1]			
Density	1.08	g/cm³	ISO 1183
Water Absorption, (23°C/saturated) [2]	0.25	%	ISO 62-1
Moisture Absorption (23°C / 50% RH) [2]	0.05	%	ISO 62
Mold Shrinkage, xflow [3]	0.5 – 0.7	%	SABIC method
Specific Gravity	1.1	-	ASTM D792
Melt Flow Rate, 280°C/5.0 kgf	12.2	g/10 min	ASTM D1238
ELECTRICAL [1]			
Comparative Tracking Index (UL) {PLC}	2	PLC Code	UL 746A
High Voltage Arc Track Rate {PLC}	4	PLC Code	UL 746A
Arc Resistance, Tungsten {PLC}	6	PLC Code	ASTM D495
FLAME CHARACTERISTICS [4]			
UL Yellow Card Link [4]	E121562-631687	-	-
Glow Wire Ignitability Temperature, 3.0 mm	750	°C	IEC 60695-2-13
Glow Wire Ignitability Temperature, 1.5 mm	725	°C	IEC 60695-2-13
Glow Wire Ignitability Temperature, 2.0 mm	700	°C	IEC 60695-2-13
Glow Wire Ignitability Temperature, 1.0 mm	725	°C	IEC 60695-2-13
Glow Wire Flammability Index, 3.0 mm	960	°C	IEC 60695-2-12
Glow Wire Flammability Index, 2.0 mm	960	°C	IEC 60695-2-12
Glow Wire Flammability Index, 1.0 mm	960	°C	IEC 60695-2-12
INJECTION MOLDING [5]			
Drying Temperature	105 – 110	°C	
Drying Time	3 – 4	Hrs	
Drying Time (Cumulative)	8	Hrs	
Maximum Moisture Content	0.02	%	
Melt Temperature	280 – 310	°C	
Rear - Zone 1 Temperature	250 – 300	°C	
Middle - Zone 2 Temperature	260 – 305	°C	

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PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Front - Zone 3 Temperature	270 – 310	°C	
Nozzle Temperature	280 – 310	°C	
Mold Temperature	75 – 105	°C	
Back Pressure	0.3 – 0.7	MPa	
Screw Speed	10 – 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) Based on internal method similar to ISO 62
(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) 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.
(5) 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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