

NORYL™ RESIN SOLUTIONS FOR THE ELECTRICAL INDUSTRY

NORYL resins typically exhibit excellent electrical properties, which typically remain stable over a wide range of temperature, humidity and frequency variations. This stability, together with a fine-tuned balance of thermal and impact properties, may make NORYL resin an excellent candidate for demanding electrical and electronic applications.



Flame retardants used in NORYL resins are bromine- and chlorine-free.

TYPICAL REQUIREMENTS

Typical material requirements for electrical applications include:

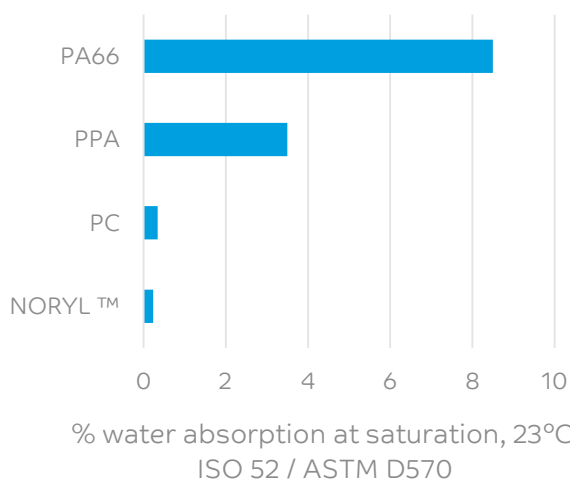
- GWFI 950°C
- GWIT 775°C
- CTI \geq 250V, preferred 600V
- UL94 V0 at low thickness
- BPT=125°C
- RTI > 105°C

TYPICAL VALUE OF NORYL RESIN

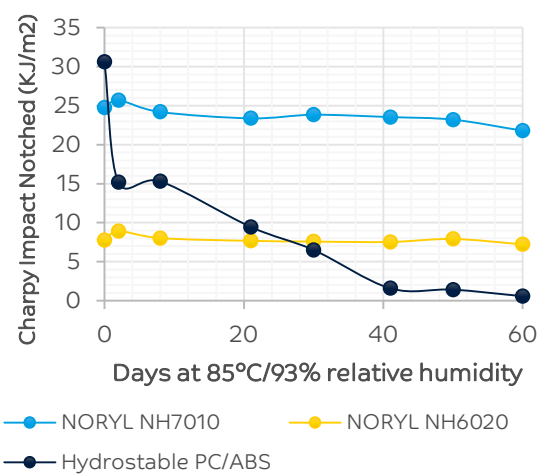
Typical benefits of NORYL resins for electrical components are:

- Low moisture uptake
- Good hydrolytic stability
- Dimensional stability
- Br- and Cl- free flame retardant
- UL94 V0 down to 0.75mm
- 5VA down to 2mm

MOISTURE UPTAKE: DIFFERENT RESINS



HYDROLITIC STABILITY OF NORYL RESIN



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TYPICAL PROPERTIES: NORYL RESINS UNFILLED GRADES

	NH4050	NH5020	NH6020	LTA6020	NH7010
Tensile Modulus, 1 mm/min (ISO 527)	2560 MPa	2980 MPa	2680 MPa	2680 MPa	2520 MPa
HDT/Af, 1.8 MPa (ISO 75/Af)	101 °C	119 °C	124 °C	126 °C	139 °C
Vicat Softening Temp, Rate B/120 (ISO 306)	120 °C	139 °C	151 °C	144 °C	162 °C
Izod Impact, notched +23°C (ISO 180/1A)	14 kJ/m ²	8 kJ/m ²	8 kJ/m ²	16kJ/m ²	20kJ/m ²
UL Recognized, 94V-0 Rating (UL 94)	1.5mm	0.75 mm	0.75 mm	1.5 mm	1.5mm
UL Recognized, 94-5VA Rating (UL 94)	-	2.5 mm	2.5 mm	2.5 mm	2 mm
Comparative Tracking Index (UL 746A)	-	2 PLC Code	0 PLC Code	2 PLC Code	2 PLC Code
Glow Wire Flammability Index 960°C, passes at (IEC 60695-2-12)	Under evaluation	1 mm	1 mm	1 mm	1.5 mm
Glow Wire Ignitability Temperature, 1.0 mm (IEC 60695-2-13)	-	750°C	825°C	825°C	825°C
Relative Temp Index, Mech w/impact (UL 746B)	-	105 °C	105 °C	125°C	105 °C

TYPICAL PROPERTIES: NORYL RESINS FILLED GRADES

	SE1GFN1	SE1GFN2	SE1GFN3	NHP5054	NHP9023
Tensile Modulus, 1 mm/min (ISO 527)	4000 MPa	5500 MPa	8000 MPa	7300MPa	5600MPa
HDT/Af, 1.8 MPa (ISO 75/Af)	135 °C	130 °C	135 °C	114°C	155°C
Vicat Softening Temp, Rate B/120 (ISO 306)	145 °C	145 °C	150 °C	135°C	163°C
Izod Impact, notched +23°C (ISO 180/1A)	7 kJ/m ²	-	-	7 kJ/m ²	7 kJ/m ²
UL Recognized, 94 Rating (UL 94)	V1 at 1.5mm	V1 at 1.5mm	V1 at 1.5mm	V0 at 0.75mm	V0 at 1.5mm
UL Recognized, 94-5VA Rating (UL 94)	2.5mm	2 mm	3 mm	-	-
Comparative Tracking Index (UL 746A)	2 PLC code	3 PLC Code	-	3 PLC code	-
Glow Wire Flammability Index 960°C, passes at (IEC 60695-2-12)	1 mm	1 mm	3.2mm	Under evaluation	Under evaluation
Glow Wire Ignitability Temperature, 1.0 mm (IEC 60695-2-13)	775 °C	800 °C	-	775°C	-
Relative Temp Index, Mech w/impact (UL 746B)	105 °C	105 °C	105 °C	115 °C	-
Melt Volume Rate, MVR at 280°C/10.0 kg (ISO 1133)	15 cm ³ /10 min	12 cm ³ /10 min	9 cm ³ /10 min	22 cm ³ /10 min	17 cm ³ /10 min

NORYL RESINS FOR SPECIFIC APPLICATIONS

- Photovoltaics (IPT –60 min at 1.5KV): NORYL V0150B resin, NORYL LTA6020 resin
- Railway: (R1 and R6 class HL3 according EN45545): NORYL NH6010B resin
- Low smoke: NORYL NH4030B
- Extrusion: NORYL NH5120 resin
- Thin wall Foam (UL94 rated V0 and 5VA at 4mm): NORYL FN150(X) resin

AMERICAS

T: 1-800-845-0600

E: productinquiries@sabic.com

EUROPE

T: (0) 0 800 1 238 5060

T2: 00 36 1 238 5060

E: webinquiries@sabic.com

ASIA/PACIFIC

E: asiaproductinquiries@sabic.com

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