

NORYL™ RESINS FOR UNATTENDED APPLIANCES

A FOCUS ON SOLUTIONS FOR CUSTOMERS IN ASIA AND THE AMERICAS

APRIL 2019

NORYL™ NH6020 RESIN FOR UNATTENDED APPLIANCES

IEC 60355 is the international regulatory standard for typical household appliances. NORYL NH6020 resin was engineered to help address the requirements of this global standard and to exhibit outstanding properties for electrical applications, such as high dielectric strength, high heat resistance, flame resistance and very good long-term dimensional stability.



NORYL NH6020 resin passes VDE/DIN 475 part 815 testing, Ball Pressure Test (BPT) at 125C, GWFI 960C at 1, 2, 3mm, GWIT 825C at 1mm, and CTI >600V making this an excellent candidate for unattended appliance components where EN/IEC 60335 applies.

TYPICAL REQUIREMENTS

Material requirements for heavy duty unattended appliances include:

- GWFI 850°C
- GWIT 775°C
- CTI ≥ 250V
- UL94 V0
- BPT = 125°C

VALUE OF NORYL RESINS

Potential benefits of NORYL resins for electrical components are:

- VDE certification
- Very good hydrolytic stability
- Dimensional stability – long-term performance
- Low moisture uptake
- Non-brominated, non-chlorinated flame retardant
- UL 5VA @ 2mm; UL94 V0 @ 0.75mm
- RTI 110°C

VDE/UL YELLOW CARD CERTIFIED PROPERTIES

NORYL RESIN GRADE	Ball Pressure* IEC 60695-10-2 (°C)	GWFI* IEC 60695-10-2 (°C/mm)	GWIT* IEC 60695-10-2 (°C/mm)	UL 94 (Listing/mm)	UL746C Outdoor Suitability	CTI IEC60112 (V)	RTI 1.5 mm UL746 (type/°C)
NH6020	125	960/0.75	775/0.75	V0/0.75	F1	600	Imp/ 105
		960/1.5	775/1.5	5VA/2.5			Elec/ 110
		960/3	775/3				Str/110

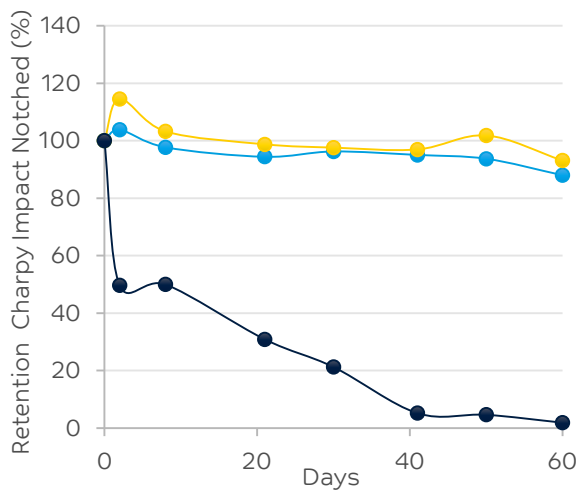
* VDE certified property, all colors

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TYPICAL PROPERTIES

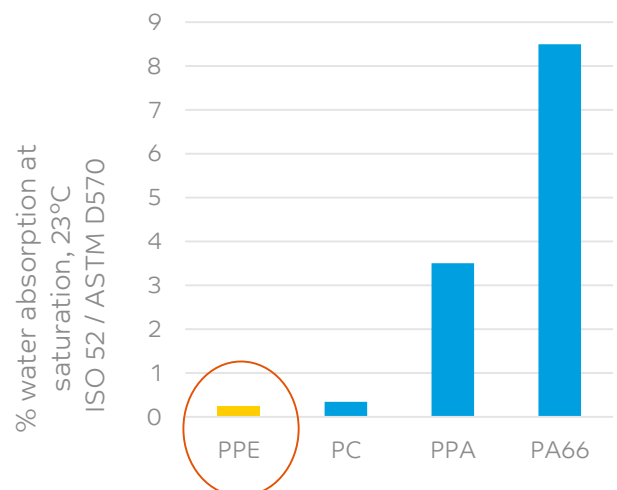
PROPERTIES	TEST METHOD	TYPICAL VALUES	UNIT
Tensile Stress, yld, Type I, 50 mm/min	ASTM D 638	78	MPa
Tensile Stress, brk, Type I, 50 mm/min	ASTM D 638	67	MPa
Tensile Modulus, 5 mm/min	ASTM D 638	2740	MPa
Flexural Stress, yld, 1.3 mm/min, 50 mm span	ASTM D 790	121	MPa
Flexural Modulus, 1.3 mm/min, 50 mm span	ASTM D 790	3020	MPa
Izod Impact, notched, 23°C	ASTM D 256	49	J/m
Izod Impact, notched, -30°C	ASTM D 256	36	J/m
Instrumented Impact Total Energy, 23°C	ASTM D 3763	18	J
Vicat Softening Temp, Rate B/50	ASTM D 1525	150	°C
HDT, 1.82 MPa, 3.2mm, unannealed	ASTM D 648	125	°C
CTE, -40°C to 40°C, flow	ASTM E 831	7.75E-05	1/°C
CTE, -40°C to 40°C, xflow	ASTM E 831	7.00E-05	1/°C
Ball Pressure Test, 125°C +/- 2°C	IEC 60695-10-2	125	-
Specific Gravity	ASTM D 792	1.14	-
Mold Shrinkage, flow, 3.2 mm	SABIC method	0.5-0.7	%
Melt Flow Rate, 280°C/5.0 kgf	ASTM D 1238	13.5	g/10 min
Moisture Absorption (23°C / 50% RH)	ISO 62	0.06	%
Melt Volume Rate, MVR at 280°C/5.0 kg	ISO 1133	11	cm ³ /10 min
Dielectric Strength, in oil, 1.6 mm	IEC 60243-1	27	kV/mm
Dissipation Factor, 1 MHz	IEC 60250	0.0029	-
Relative Permittivity, 50/60 Hz	IEC 60250	2.7	-
UL Recognized, 94-5VA Flame Class Rating	UL 94	≥2.5	mm
UL Recognized, 94V-0 Flame Class Rating	UL 94	≥0.75	mm
Glow Wire Flammability Index, 1.0 mm	IEC 60695-2-12	960	°C
Glow Wire Ignitability Temperature, 1.0 mm	IEC 60695-2-13	825	°C
UV-light, water exposure/immersion	UL 746C	F1	

IMPACT RESISTANCE RETENTION AT 80°C & 93%RH



● NORYL NH7010 ● NORYL NH6020
● Hydrostable PC/ABS

MOISTURE ABSORPTION COMPARISON



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