



NORYL™ Resin HS2000X

Americas: COMMERCIAL

PPE+PS blend. 17% Mineral reinforced. Non-brominated, non-chlorinated FR system. UL94 V0 and 5VA listing. UL746C f1. Radiant panel listing. Dielectric strength. Dimensional stability. Suitable for E/E market indoor/outdoor applications including electrical ceiling boxes and smoke detectors.

TYPICAL PROPERTIES ¹	TYPICAL VALUE	Unit	Standard
MECHANICAL			
Tensile Stress, yld, Type I, 5 mm/min	750	kgf/cm ²	ASTM D 638
Tensile Stress, brk, Type I, 5 mm/min	610	kgf/cm ²	ASTM D 638
Tensile Strain, yield	3.8	%	ASTM D 638
Tensile Strain, brk, Type I, 5 mm/min	8.4	%	ASTM D 638
Tensile Modulus, 5 mm/min	37200	kgf/cm ²	ASTM D 638
Flexural Stress, brk, 1.3 mm/min, 50 mm span	1190	kgf/cm ²	ASTM D 790
Flexural Stress, yld, 2.6 mm/min, 100 mm span	1190	kgf/cm ²	ASTM D 790
Flexural Modulus, 1.3 mm/min, 50 mm span	37400	kgf/cm ²	ASTM D 790
Flexural Modulus, 2.6 mm/min, 100 mm span	36200	kgf/cm ²	ASTM D 790
Tensile Stress, yield	71	MPa	ISO 527
Tensile Stress, break	57	MPa	ISO 527
Tensile Strain, yield	3.7	%	ISO 527
Tensile Strain, break	10.5	%	ISO 527
Tensile Modulus, 1 mm/min	4000	MPa	ISO 527
Flexural Stress	117	MPa	ISO 178
Flexural Modulus	3800	MPa	ISO 178
IMPACT			
Izod Impact, unnotched, 23°C	227	cm-kgf/cm	ASTM D 4812
Izod Impact, notched, 23°C	13	cm-kgf/cm	ASTM D 256
Izod Impact, Reverse Notched, 3.2 mm	82	cm-kgf/cm	ASTM D 256
Instrumented Impact Total Energy, 23°C	4517	cm-kgf	ASTM D 3763
Izod Impact, notched 80*10*4 +23°C	9	kJ/m ²	ISO 180/1A



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TYPICAL PROPERTIES ¹	TYPICAL VALUE	Unit	Standard
IMPACT			
Charpy Impact, notched, 23°C	10	kJ/m ²	ISO 179/2C
THERMAL			
HDT, 0.45 MPa, 3.2 mm, unannealed	117	°C	ASTM D 648
HDT, 1.82 MPa, 3.2mm, unannealed	108	°C	ASTM D 648
HDT, 0.45 MPa, 6.4 mm, unannealed	128	°C	ASTM D 648
HDT, 1.82 MPa, 6.4 mm, unannealed	116	°C	ASTM D 648
CTE, -40°C to 40°C, flow	7.06E-05	1/°C	ASTM E 831
CTE, -40°C to 40°C, xflow	7.76E-05	1/°C	ASTM E 831
Vicat Softening Temp, Rate B/50	132	°C	ISO 306
Vicat Softening Temp, Rate B/120	136	°C	ISO 306
HDT/Be, 0.45MPa Edgew 120*10*4 sp=100mm	126	°C	ISO 75/Be
HDT/Ae, 1.8 MPa Edgew 120*10*4 sp=100mm	111	°C	ISO 75/Ae
Relative Temp Index, Elec	100	°C	UL 746B
Relative Temp Index, Mech w/impact	85	°C	UL 746B
Relative Temp Index, Mech w/o impact	100	°C	UL 746B
PHYSICAL			
Specific Gravity	1.25	-	ASTM D 792
Mold Shrinkage, flow, 3.2 mm (5)	0.5 - 0.7	%	SABIC Method
Melt Flow Rate, 280°C/5.0 kgf	7.6	g/10 min	ASTM D 1238
Melt Flow Rate, 300°C/5.0 kgf	7.6	g/10 min	ASTM D 1238
Melt Volume Rate, MVR at 280°C/5.0 kg	6	cm ³ /10 min	ISO 1133
Melt Volume Rate, MVR at 300°C/5.0 kg	6	cm ³ /10 min	ISO 1133
ELECTRICAL			
Volume Resistivity	1.2E+16	Ohm-cm	ASTM D 257
Surface Resistivity	>1.E+16	Ohm	ASTM D 257
Dielectric Strength, in oil, 3.2 mm	17.3	kV/mm	ASTM D 149



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TYPICAL PROPERTIES ¹	TYPICAL VALUE	Unit	Standard
ELECTRICAL			
Relative Permittivity, 50/60 Hz	2.89	-	ASTM D 150
Relative Permittivity, 1 MHz	2.7	-	ASTM D 150
Dissipation Factor, 50/60 Hz	0.017	-	ASTM D 150
Dissipation Factor, 1 MHz	0.0044	-	ASTM D 150
Arc Resistance, Tungsten {PLC}	6	PLC Code	ASTM D 495
Hot Wire Ignition {PLC}	0	PLC Code	UL 746A
High Voltage Arc Track Rate {PLC}	3	PLC Code	UL 746A
High Ampere Arc Ign, surface {PLC}	2	PLC Code	UL 746A
Comparative Tracking Index (UL) {PLC}	2	PLC Code	UL 746A
FLAME CHARACTERISTICS			
UL Recognized, 94V-0 Flame Class Rating (3)	1.47	mm	UL 94
UL Recognized, 94-5VA Rating (3)	2	mm	UL 94
Radiant Panel Listing	YES	-	UL Tested
UV-light, water exposure/immersion	F1	-	UL 746C



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PROCESSING PARAMETERS	TYPICAL VALUE	Unit
Injection Molding		
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
Nozzle Temperature	280 - 310	°C
Front - Zone 3 Temperature	270 - 310	°C
Middle - Zone 2 Temperature	260 - 305	°C
Rear - Zone 1 Temperature	250 - 300	°C
Mold Temperature	75 - 105	°C
Back Pressure	0.3 - 0.7	MPa
Screw Speed	20 - 100	rpm
Shot to Cylinder Size	30 - 70	%