

## Noryl\* Resin SE1X

### Americas: COMMERCIAL

PPE+PS blend. Unfilled. Non-brominated, non-chlorinated FR system. UL94 V1, UL746C F1. Dielectric strength. Suitable for E/E market indoor/outdoor applications.

TYPICAL PROPERTIES <sup>1</sup>	TYPICAL VALUE	Unit	Standard
<b>MECHANICAL</b>			
Tensile Stress, yld, Type I, 50 mm/min	660	kgf/cm <sup>2</sup>	ASTM D 638
Tensile Stress, brk, Type I, 50 mm/min	540	kgf/cm <sup>2</sup>	ASTM D 638
Tensile Strain, yld, Type I, 50 mm/min	4	%	ASTM D 638
Tensile Strain, brk, Type I, 50 mm/min	15	%	ASTM D 638
Tensile Modulus, 50 mm/min	25400	kgf/cm <sup>2</sup>	ASTM D 638
Flexural Stress, yld, 1.3 mm/min, 50 mm span	1010	kgf/cm <sup>2</sup>	ASTM D 790
Flexural Stress, yld, 2.6 mm/min, 100 mm span	990	kgf/cm <sup>2</sup>	ASTM D 790
Flexural Modulus, 1.3 mm/min, 50 mm span	27500	kgf/cm <sup>2</sup>	ASTM D 790
Flexural Modulus, 2.6 mm/min, 100 mm span	24400	kgf/cm <sup>2</sup>	ASTM D 790
Tensile Stress, yield, 50 mm/min	61	MPa	ISO 527
Tensile Stress, break, 50 mm/min	50	MPa	ISO 527
Tensile Strain, yield, 50 mm/min	4.3	%	ISO 527
Tensile Strain, break, 50 mm/min	20.7	%	ISO 527
Tensile Modulus, 1 mm/min	2670	MPa	ISO 527
Flexural Stress, yield, 2 mm/min	99	MPa	ISO 178
Flexural Modulus, 2 mm/min	2560	MPa	ISO 178
<b>IMPACT</b>			
Izod Impact, unnotched, 23°C	265	cm-kgf/cm	ASTM D 4812
Izod Impact, notched, 23°C	18	cm-kgf/cm	ASTM D 256
Izod Impact, notched, -30°C	10	cm-kgf/cm	ASTM D 256
Instrumented Impact Total Energy, 23°C	506	cm-kgf	ASTM D 3763
Izod Impact, notched 80*10*4 +23°C	14	kJ/m <sup>2</sup>	ISO 180/1A

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(3) This rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.

(4) Internal measurements according to UL standards.

(5) 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.

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TYPICAL PROPERTIES <sup>1</sup>	TYPICAL VALUE	Unit	Standard
<b>THERMAL</b>			
HDT, 0.45 MPa, 3.2 mm, unannealed	126	°C	ASTM D 648
HDT, 1.82 MPa, 3.2mm, unannealed	112	°C	ASTM D 648
HDT, 0.45 MPa, 6.4 mm, unannealed	129	°C	ASTM D 648
HDT, 1.82 MPa, 6.4 mm, unannealed	118	°C	ASTM D 648
CTE, -40°C to 40°C, flow	8.04E-05	1/°C	ASTM E 831
CTE, -40°C to 40°C, xflow	8.81E-05	1/°C	ASTM E 831
Vicat Softening Temp, Rate B/50	132	°C	ISO 306
Vicat Softening Temp, Rate B/120	135	°C	ISO 306
HDT/Be, 0.45MPa Edgew 120*10*4 sp=100mm	129	°C	ISO 75/Be
HDT/Ae, 1.8 MPa Edgew 120*10*4 sp=100mm	115	°C	ISO 75/Ae
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
<b>PHYSICAL</b>			
Specific Gravity	1.09	-	ASTM D 792
Water Absorption, 24 hours	0.06	%	ASTM D 570
Mold Shrinkage, flow, 3.2 mm	0.5 - 0.7	%	SABIC Method
Mold Shrinkage on Tensile Bar, xflow (2)	0.5 - 0.7	%	SABIC Method
Melt Flow Rate, 280°C/5.0 kgf	8.5	g/10 min	ASTM D 1238
Melt Volume Rate, MVR at 280°C/5.0 kg	8	cm <sup>3</sup> /10 min	ISO 1133
<b>ELECTRICAL</b>			
Volume Resistivity	2.3E+16	Ohm-cm	ASTM D 257
Surface Resistivity	>1.E+15	Ohm	ASTM D 257
Dielectric Strength, in oil, 3.2 mm	18.1	kV/mm	ASTM D 149
Relative Permittivity, 50/60 Hz	2.52	-	ASTM D 150

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TYPICAL PROPERTIES <sup>1</sup>	TYPICAL VALUE	Unit	Standard
<b>ELECTRICAL</b>			
Relative Permittivity, 1 MHz	2.46	-	ASTM D 150
Dissipation Factor, 50/60 Hz	0.0034	-	ASTM D 150
Dissipation Factor, 1 MHz	0.0021	-	ASTM D 150
Arc Resistance, Tungsten {PLC}	6	PLC Code	ASTM D 495
High Voltage Arc Track Rate {PLC}	4	PLC Code	UL 746A
Comparative Tracking Index (UL) {PLC}	1	PLC Code	UL 746A
<b>FLAME CHARACTERISTICS</b>			
UL Recognized, 94V-1 Flame Class Rating (3)	1.47	mm	UL 94
UL Recognized, 94V-0 Flame Class Rating (3)	5.99	mm	UL 94
Radiant Panel Listing	RP100	-	UL Tested
UV-light, water exposure/immersion	F1	-	UL 746C

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PROCESSING PARAMETERS	TYPICAL VALUE	Unit
<b>Injection Molding</b>		
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	%

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