

**NORYL* SE1X Resin**

GE Plastics - Polyphenylene Ether + PS

Unit System:

Actions[Legend \(Open\)](#)**General Information****Product Description**

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

General

Material Status	• Commercial: Active
Availability	• North America
Test Standards Available	• ASTM • ISO
Additive	• Ignition Resistant
Features	• Bromine Content, None • Chlorine Content, None • Flame Retardant
Uses	• Electrical/Electronic Applications • Outdoor Applications
Forms	• Pellets
Processing Method	• Injection Molding
Multi-Point Data	• Coefficient of Thermal Expansion vs. Temperature (ASTM E831) • Compressive Stress vs. Strain (ASTM D695) • Elastic Modulus vs Temperature (ASTM D4065) • Flexural DMA (ASTM D4065) • Pressure-Volume-Temperature (PVT - Zoller Method) • Shear DMA (ASTM D4065) • Specific Heat vs. Temperature (ASTM D3417) • Tensile Creep (ASTM D2990) • Tensile Fatigue • Tensile Stress vs. Strain (ASTM D638) • Thermal Conductivity vs. Temperature (ASTM E1530) • Viscosity vs. Shear Rate (ASTM D3835)

ASTM and ISO Properties ¹

Physical	Nominal Value	Unit	Test Method
Density -Specific Gravity	1.09	sp gr 23/23°C	ASTM D792
Melt Mass-Flow Rate (MFR) (280°C/5.0 kg)	8.5	g/10 min	ASTM D1238
Melt Volume-Flow Rate (MVR) (280°C/5.0 kg)	0.531	in ³ /10min	ISO 1133
Mold Shrink, Linear-Flow (0.126 in)	0.0050 to 0.0070	in/in	ASTM D955
Water Absorption @ 24 hrs	0.060	%	ASTM D570
Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus ²	363000	psi	ASTM D638

Tensile Modulus ³	387000 psi	ISO 527-1, -2
Tensile Strength @ Yield ⁴	9430 psi	ASTM D638
Tensile Stress at Yield ²	8890 psi	ISO 527-1, -2
Tensile Strength @ Break ⁴	7700 psi	ASTM D638
Tensile Stress at Break ²	7370 psi	ISO 527-1, -2
Tensile Elongation @ Yld ⁴	4.0 %	ASTM D638
Tensile Strain at Yield ²	4.3 %	ISO 527-1, -2
Tensile Elongation @ Brk ⁴	15 %	ASTM D638
Tensile Strain at Break ²	21 %	ISO 527-1, -2
Flexural Modulus		ASTM D790
(3.94 in Span) ⁵	348000 psi	
(1.97 in Span) ⁶	392000 psi	
Flexural Modulus ⁷	371000 psi	ISO 178
Flexural Strength @ Yield		ASTM D790
(1.97 in Span) ⁶	14500 psi	
(3.94 in Span) ⁵	14200 psi	
Impact	Nominal Value Unit	Test Method
Notched Izod Impact		ASTM D256
(-22 °F)	2.00 ft-lb/in	
(73 °F)	3.37 ft-lb/in	
Notched Izod Impact Strength (73 °F) ⁸	7.04 ft-lb/in ²	ISO 180
Unnotched Izod Impact (73 °F)	48.7 ft-lb/in	ASTM D256
Instrumented Dart Impact (73 °F)	Total Energy: 440 in-lb	ASTM D3763
Thermal	Nominal Value Unit	Test Method
DTUL @66psi - Unannealed		ASTM D648
(0.126 in)	260 °F	
(0.252 in)	264 °F	
HDT B (0.45 MPa) Unannealed ⁹	264 °F	ISO 75B-1, -2
DTUL @264psi - Unannealed		ASTM D648
(0.126 in)	235 °F	
(0.252 in)	245 °F	
HDT A (1.80 MPa) Unannealed ⁹	239 °F	ISO 75A-1, -2
Vicat Softening Temperature		ISO 306
(B120 (120°C/h 50N))	275 °F	
(B50 (50°C/h 50N))	270 °F	
CLTE, Flow (TMA) (-40 to 104°F (-40 to 40°C))	0.000045 in/in/°F	ASTM E831
CLTE, Transverse (TMA) (-40 to 104°F (-40 to 40°C))	0.000049 in/in/°F	ASTM E831
Electrical	Nominal Value Unit	Test Method
Surface Resistivity	1.0E+15 ohms	ASTM D257
Volume Resistivity	2.3E+16 ohm-cm	ASTM D257
Dielectric Strength (0.126 in, in Oil)	460 V/mil	ASTM D149
Dielectric Constant		ASTM D150
(50 Hz)	2.520	

(60 Hz)	2.520	
(1E+6 Hz)	2.460	
Dissipation Factor		ASTM D150
(50 Hz)	0.0034	
(60 Hz)	0.0034	
(1E+6 Hz)	0.0021	
Arc Resistance (PLC) (Tungsten Electrode)	PLC 6	ASTM D495

Flammability	Nominal Value	Unit	Test Method
Flame Rating - UL			UL 94
(0.0580 in)	V-1		
(0.236 in)	V-0		
UL 746	Nominal Value	Unit	Test Method
RTI Str	230	°F	UL 746
RTI Imp	221	°F	UL 746
RTI Elec	230	°F	UL 746
Comparative Tracking Index (CTI) (PLC)	PLC 1		UL 746
High Voltage Arc Tracking Rate (HVTR) (PLC)	PLC 4		UL 746
Outdoor Suitability	f1		UL 746C

Additional Properties

The value listed as Unnotched Izod Impact, ASTM D256, was tested in accordance with ASTM D4812.

Surface Resistivity, ASTM D257: >1.0E15

Flexural Stress at Yield, ISO 178, 2 mm/min: 100 MPa

Mold Shrinkage, Across Flow, Tensile Bar: 0.5 to 0.7%

Radiant Panel Listing, UL Tested: RP100

Processing Information

Injection	Nominal Value	Unit
Drying Temperature	220 to 230	°F
Drying Time	3.0 to 4.0	hr
Drying Time, Maximum	8.0	hr
Suggested Max Moisture	0.020	%
Suggested Shot Size	30 to 70	%
Rear Temperature	480 to 570	°F
Middle Temperature	500 to 580	°F
Front Temperature	520 to 590	°F
Nozzle Temperature	540 to 590	°F
Processing (Melt) Temp	540 to 590	°F
Mold Temperature	170 to 220	°F
Back Pressure	50.0 to 100.0	psi
Screw Speed	20 to 100	rpm

Notes

¹ Typical properties: these are not to be construed as specifications.

² 2.0 in/min

³ 0.039 in/min

⁴ Type I, 2.0 in/min

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5 0.10 in/min

6 0.051 in/min

7 0.079 in/min

8 Type 1, Notch A

9 Edgewise, 120*10*4 mm, 3.94 in
