DuPont™ Rynite® PET

thermoplastic polyester resin

Rynite® 935 NC010

Rynite® 935 NC010 is a 35% mica/glass reinforced modified polyethylene terephthalate resin with exceptionally low warpage, excellent electrical properties, high stiffness, and high heat resistance.

Property	Test Method	Units	Value
Identification			
Resin Identification	ISO 1043		PET-(MD+GF)35
Part Marking Code	ISO 11469		>PET-(MD+GF)35<
Mechanical			
Stress at Break	ISO 527	MPa (kpsi)	85 (12.3)
Tensile Strength	ASTM D 638	MPa (kpsi)	
-40°C (-40°F)			121 (17.5)
23°C (73°F)			89.6 (13.0)
90°C (194°F)			40.7 (5.9)
150°C (300°F)			29.7 (4.3)
Strain at Break	ISO 527	%	2
Elongation at Break	ASTM D 638	%	
-40°C (-40°F)			1.8
23°C (73°F)			2.0
90°C (194°F)			5.0
150°C (300°F)			7.0
Tensile Modulus	ASTM D 638	MPa (kpsi)	
-40°C (-40°F)			11200 (1620)
23°C (73°F)			9930 (1440)
90°C (194°F)			3170 (460)
150°C (300°F)			2420 (351)

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ISO Mechanical properties measured at 4.0mm, ISO Electrical properties measured at 2.0mm, and all ASTM properties measured at 3.2mm.
Test temperatures are 23°C unless otherwise stated.
Shrinkage generated per ISO 294-4 based on 60 X 60mm end-gated plagues or ASTM D 955 based on 76 X 127mm (3 X 5in) end-gated plaques.

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Mechanical			
Tensile Modulus	ISO 527	MPa (kpsi)	10200 (1480)
Tensile Creep Modulus	ISO 899	MPa (kpsi)	
1h			9350 (1360)
1000h			7690 (1115)
Shear Strength	ASTM D 732	MPa (kpsi)	53.7 (7.8)
Poissons Ratio			0.38
Flexural Modulus	ASTM D 790	MPa (kpsi)	
-40°C (-40°F)			11700 (1700)
23°C (73°F)			9600 (1400)
90°C (194°F)			3370 (489)
150°C (300°F)			2200 (320)
Flexural Modulus	ISO 178	MPa (kpsi)	
-40°C (-40°F)			11800 (1710)
23°C (73°F)			9100 (1320)
93°C (200°F)			3400 (490)
150°C (300°F)			2200 (320)
Flexural Strength	ASTM D 790	MPa (kpsi)	
-40°C (-40°F)			176 (25.5)
23°C (73°F)			141 (20.5)
90°C (194°F)			62.1 (9.0)
150°C (300°F)			42.7 (6.2)
Compressive Strength	ASTM D 695	MPa (kpsi)	141 (20.5)
Flexural Fatigue	ASTM D 671	MPa (kpsi)	
Cycles 10E6			33.1 (4.8)
Flexural Creep Strain	ASTM D 2990	%	
23°C (73°F), 27.6MPa (4000psi)			0.50
60°C (140°F), 27.6MPa (4000psi)			0.91
125°C (257°F), 27.6MPa (4000psi)			2.50

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Mechanical			
Notched Izod Impact Strength	ISO 180/1A	kJ/m^2	
-30°C (-22°F)			4
23°C (73°F)			6
Izod Impact	ASTM D 256	J/m (ft lb/in)	
-40°C (-40°F)			43 (0.8)
23°C (73°F)			64 (1.2)
Unnotched Izod Impact Strength	ISO 180/1U	kJ/m^2	30
Unnotched Impact	ASTM D 4812	J/m (ft lb/in)	
-40°C (-40°F)			280 (5.2)
23°C (73°F)			425 (8.0)
Notched Charpy Impact Strength	ISO 179/1eA	kJ/m^2	
-30°C (-22°F)			4
23°C (73°F)			6
Unnotched Charpy Impact Strength	ISO 179/1eU	kJ/m^2	
-30°C (-22°F)			20
23°C (73°F)			25
Thermal			
Deflection Temperature	ISO 75f	°C (°F)	
0.45MPa			235 (455)
1.80MPa			200 (392)
Melting Temperature	ISO 11357-1/-3	°C (°F)	
10°C/min			252 (486)
CLTE, Normal	ISO 11359-1/-2	E-4/C (E-4/F)	
-40 - 23°C (-40 - 73°F)			0.53 (0.29)
23 - 55°C (73 - 130°F)			0.52 (0.29)
23 - 55°C (73 - 130°F), 2.0mm			0.74 (0.41)
55 - 160°C (130 - 320°F)			0.81 (0.45)

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Thermal			
CLTE, Parallel	ISO 11359-1/-2	E-4/C (E-4/F)	
-40 - 23°C (-40 - 73°F)			0.26 (0.14)
23 - 55°C (73 - 130°F)			0.16 (0.09)
23 - 55°C (73 - 130°F), 2.0mm			0.23 (0.13)
55 - 160°C (130 - 320°F)			0.14 (0.08)
Thermal Conductivity	ASTM C 177	W/m K (Btu in/h ft^2 F)	0.26 (1.8)
Vicat Softening Temperature	ISO 306	°C (°F)	
50N			204 (399)
Electrical			
Surface Resistivity	IEC 60093	ohm	1E14
Relative Permittivity	IEC 60250		
1E2 Hz			4.5
1E6 Hz			4.1
Volume Resistivity	IEC 60093	ohm m	1E13
Dielectric Strength, Short Time	ASTM D 149	kV/mm (V/mil)	
23°C (73°F), 500 V/s, in oil, 1.6mm (0.062in)			29.5 (750)
23°C (73°F), 500 V/s, in oil, 3.2mm (0.126in)			23.5 (600)
95°C (200°F), 500 V/s, in oil, 1.6mm (0.062in)			25.5 (650)
95°C (200°F), 500 V/s, in oil, 3.2mm (0.126in)			19.5 (495)
150°C (300°F), 500 V/s, in oil, 1.6mm (0.062in)			14.5 (375)
150°C (300°F), 500 V/s, in oil, 3.2mm (0.126in)			12.0 (300)
Dielectric Strength, Step by Step	ASTM D 149	kV/mm (V/mil)	
3.2mm (0.126in)			21 (530)
Dielectric Constant	ASTM D 150		
1E3 Hz			3.8
1E6 Hz			3.7
Dissipation Factor	ASTM D 150		
1E3 Hz			0.008
1E6 Hz			0.010

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Electrical			
Dissipation Factor	IEC 60250	E-4	
1E2 Hz			300
1E6 Hz			250
Electric Strength	IEC 60243-1	kV/mm (V/mil)	
1.0mm			39 (990)
Arc Resistance	ASTM D 495	s	120-180
Arc Resistance	UL 746A	s	
Plate 4mm			131
CTI	IEC 60112	V	300
CTI	UL 746A	V	250
Flammability			
Flammability Classification	IEC 60695-11-10		
0.75mm			HB
Flammability Classification	UL94		
0.75mm			HB
Oxygen Index	ISO 4589-1/-2	%	21
Glow Wire Flammability Index	IEC 60695-2-12	°C	
0.75mm			775
1.5mm			775
3.0mm			825
Glow Wire Ignition Temperature	IEC 60695-2-13	°C	
0.75mm			800
1.5mm			800
3.0mm			850
High Amperage Arc Ignition Resistance	UL 746A	arcs	
0.75mm			60
1.5mm			66
3.0mm			60

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Flammability			
High Voltage Arc Tracking Rate		mm/min	10-25
Hot Wire Ignition	UL 746A	s	
0.75mm			30
1.5mm			60
3.0mm			120
Temperature Index			
RTI, Electrical	UL 746B	°C	
0.75mm			140
RTI, Impact	UL 746B	°C	
0.75mm			140
RTI, Strength	UL 746B	°C	
0.75mm			140
Other			
Density	ISO 1183	kg/m^3 (g/cm^3)	1580 (1.58)
Hardness, Rockwell	ASTM D 785		
Scale M			75
Scale R			115
Hardness, Rockwell	ISO 2039/2		
Scale M			75
Scale R			115
Coefficient of Friction	ASTM D 1894		
Self			0.21
Self, static			0.21
Steel			0.19
Steel, static			0.19
Water Absorption	ASTM D 570	%	
50%RH,23°C,24h			0.05

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Other			
Water Absorption	ISO 62, Similar to	%	
Equilibrium 50%RH			0.13
Saturation, immersed			0.83
Molding Shrinkage	ISO 294-4	%	
Normal, 2.0mm			0.7
Normal, Annealed			0.9
Parallel, 2.0mm			0.3
Parallel, Annealed			0.35
Mold Shrinkage		%	
Flow, 1.57mm (0.062in)			0.28
Flow, 3.2mm (0.126in)			0.35
Transverse, 1.57mm (0.062in)			0.52
Transverse, 3.2mm (0.126in)			0.65
Processing			
Melt Temperature Range		°C (°F)	280-300 (535-570)
Melt Temperature Optimum		°C (°F)	285 (545)
Mold Temperature Range		°C (°F)	>95 (>205)
Mold Temperature Optimum		°C (°F)	110 (230)
Drying Time, Dehumidified Dryer		h	4
Drying Temperature		°C (°F)	120 (250)
Processing Moisture Content		%	<0.02
Snake Flow		mm	
90MPa, 5x0.30mm			12
90MPa, 5x0.50mm			43
90MPa, 5x0.75mm			87
90MPa, 5x1.00mm			132

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