



Rynite® FR543 NC010

DuPont Engineering Polymers - Polyethylene Terephthalate

Wednesday, September 17, 2008

General Information

Product Description

Rynite® FR543 NC010 is a flame retardant, 43% glass reinforced polyethylene terephthalate. Has a 155C temperature index that is equivalent to many thermosets. Recognized by UL as UL94V-0 at 0.8mm(0.03in).

General

Material Status	• Commercial: Active
Availability	• North America
Filler / Reinforcement	• Glass Fiber Reinforcement, 43% Filler by Weight
Additive	• Heat Stabilizer • Ignition Resistant
Features	• Flame Retardant • Good Stiffness • Heat Stabilized • Good Dimensional Stability • Good Strength • Ultrasonic Weldable • Good Electrical Properties • Good Thermal Aging Resistance
Uses	• Appliances • Electrical/Electronic Applications • Structural Parts • Electrical Parts • Phenolic Replacement
RoHS Compliance	• Contact Manufacturer
Appearance	• Natural Color
Forms	• Pellets
Processing Method	• Injection Molding
Multi-Point Data	• Isothermal Stress vs. Strain (ISO 11403-1)
Part Marking Code (ISO 11469)	• >PET-GF43FR(17)<
Resin ID (ISO 1043)	• PET-GF43FR(17)

ASTM and ISO Properties ¹

Physical	Nominal Value (English)	Nominal Value (SI)	
Specific Gravity			
--	1.79	1.79	ASTM D792
--	1.79 g/cm ³	1.79 g/cm ³	ISO 1183
Molding Shrinkage			
Flow, 0.0618 in (1.57 mm)	0.0013 in/in	0.13 %	Internal Method
Flow, 0.126 in (3.20 mm)	0.0020 in/in	0.20 %	Internal Method
Across Flow, 0.0618 in (1.57 mm)	0.0048 in/in	0.48 %	Internal Method
Across Flow, 0.126 in (3.20 mm)	0.0065 in/in	0.65 %	Internal Method
Across Flow ²	1.0 %	1.0 %	ISO 294-4
Flow ²	0.25 %	0.25 %	ISO 294-4
Across Flow, 0.0787 in (2.00 mm)	0.75 %	0.75 %	ISO 294-4
Flow, 0.0787 in (2.00 mm)	0.20 %	0.20 %	ISO 294-4
Water Absorption			
73°F (23°C), Saturation	0.62 %	0.62 %	ISO 62
Equilibrium, 50% RH, 73°F (23°C)	0.060 %	0.060 %	ASTM D570
73°F (23°C), Equilibrium, 50 % RH	0.11 %	0.11 %	ISO 62

Rynite® FR543 NC010
DuPont Engineering Polymers - Polyethylene Terephthalate

Mechanical	Nominal Value (English)	Nominal Value (SI)	Test Method
Tensile Modulus			
-40°F (-40°C)	2.48E+6 psi	17100 MPa	ASTM D638
73°F (23°C)	2.39E+6 psi	16500 MPa	ASTM D638
194°F (90°C)	1.19E+6 psi	8210 MPa	ASTM D638
302°F (150°C)	732000 psi	5050 MPa	ASTM D638
73°F (23°C)	2.47E+6 psi	17000 MPa	ISO 527-2
Tensile Stress			
Break, 73°F (23°C)	24700 psi	170 MPa	ISO 527-2
-40°F (-40°C)	30500 psi	210 MPa	ASTM D638
73°F (23°C)	24900 psi	172 MPa	ASTM D638
194°F (90°C)	12500 psi	86.5 MPa	ASTM D638
302°F (150°C)	8010 psi	55.2 MPa	ASTM D638
Tensile Elongation			
Break, -40°F (-40°C)	1.7 %	1.7 %	ASTM D638
Break, 73°F (23°C)	1.8 %	1.8 %	ASTM D638
Break, 194°F (90°C)	4.3 %	4.3 %	ASTM D638
Break, 302°F (150°C)	5.5 %	5.5 %	ASTM D638
Break, 73°F (23°C)	1.8 %	1.8 %	ISO 527-2
Flexural Modulus			
-40°F (-40°C)	2.20E+6 psi	15200 MPa	ASTM D790
73°F (23°C)	2.10E+6 psi	14500 MPa	ASTM D790
194°F (90°C)	999000 psi	6890 MPa	ASTM D790
302°F (150°C)	421000 psi	2900 MPa	ASTM D790
-40°F (-40°C)	2.19E+6 psi	15100 MPa	ISO 178
73°F (23°C)	2.10E+6 psi	14500 MPa	ISO 178
199°F (93°C)	1.00E+6 psi	6900 MPa	ISO 178
302°F (150°C)	450000 psi	3100 MPa	ISO 178
Flexural Strength			
-40°F (-40°C)	45000 psi	310 MPa	ASTM D790
73°F (23°C)	36000 psi	248 MPa	
194°F (90°C)	20000 psi	138 MPa	
302°F (150°C)	11500 psi	79.3 MPa	
Compressive Strength (73°F (23°C))			
	33500 psi	231 MPa	ASTM D695
Shear Strength (73°F (23°C))			
	8500 psi	58.6 MPa	ASTM D732
Impact	Nominal Value (English)	Nominal Value (SI)	Test Method
Charpy Notched Impact Strength			
-22°F (-30°C)	4.76 ft·lb/in ²	10.00 kJ/m ²	ISO 179/1eA
73°F (23°C)	4.76 ft·lb/in ²	10.00 kJ/m ²	
Charpy Unnotched Impact Strength			
-22°F (-30°C)	14.3 ft·lb/in ²	30.0 kJ/m ²	ISO 179/1eU
73°F (23°C)	20.5 ft·lb/in ²	43.0 kJ/m ²	
Notched Izod Impact			
-40°F (-40°C)	1.70 ft·lb/in	91.0 J/m	ASTM D256
73°F (23°C)	1.80 ft·lb/in	96.0 J/m	
Unnotched Izod Impact			
-40°F (-40°C)	9.55 ft·lb/in	510 J/m	ASTM D4812
73°F (23°C)	14.1 ft·lb/in	750 J/m	

Copyright © 2008 - IDES - The Plastics Web ®

The information presented on this data sheet was acquired by IDES from the producer of the material. IDES makes substantial efforts to assure the accuracy of this data. However, IDES assumes no responsibility for the data values and strongly encourages that upon final material selection, data points are validated with the material supplier.

IDES - The Plastics Web ®

800-788-4668 or 307-742-9227 | www.ides.com

Rynite® FR543 NC010

DuPont Engineering Polymers - Polyethylene Terephthalate

Hardness	Nominal Value (English)	Nominal Value (SI)	
Rockwell Hardness			
M-Scale	95	95	ASTM D785
R-Scale	120	120	ASTM D785
M-Scale	102	102	ISO 2039-2
R-Scale	122	122	ISO 2039-2
Thermal	Nominal Value (English)	Nominal Value (SI)	Test Method
Deflection Temperature Under Load			
66 psi (0.45 MPa), Unannealed	477 °F	247 °C	ASTM D648
66 psi (0.45 MPa), Unannealed	464 °F	240 °C	ISO 75-2/B
264 psi (1.8 MPa), Unannealed	435 °F	224 °C	ASTM D648
264 psi (1.8 MPa), Unannealed	435 °F	224 °C	ISO 75-2/A
Melting Temperature	489 °F	254 °C	ASTM D3418 ISO 11357-3
CLTE			
Flow, -40 to 73°F (-40 to 23°C)	8.9E-6 in/in/°F	0.000016 cm/cm/°C	ASTM E831
Flow, 73 to 131°F (23 to 55°C)	6.1E-6 in/in/°F	0.000011 cm/cm/°C	ASTM E831
Flow, 131 to 320°F (55 to 160°C)	3.9E-6 in/in/°F	7.0E-6 cm/cm/°C	ASTM E831
Flow, 73 to 131°F (23 to 55°C), 0.0787 in (2.00 mm)	9.4E-6 in/in/°F	0.000017 cm/cm/°C	ASTM E831
Transverse, -40 to 73°F (-40 to 23°C)	0.000031 in/in/°F	0.000055 cm/cm/°C	ASTM E831
Transverse, 73 to 131°F (23 to 55°C)	0.000044 in/in/°F	0.000079 cm/cm/°C	ASTM E831
Transverse, 131 to 320°F (55 to 160°C)	0.000053 in/in/°F	0.000096 cm/cm/°C	ASTM E831
Transverse, 73 to 131°F (23 to 55°C), 0.0787 in (2.00 mm)	0.000047 in/in/°F	0.000085 cm/cm/°C	ASTM E831
Transverse, -40 to 73°F (-40 to 23°C)	0.000031 in/in/°F	0.000055 cm/cm/°C	ISO 11359-2
Transverse, 73 to 131°F (23 to 55°C)	0.000044 in/in/°F	0.000079 cm/cm/°C	ISO 11359-2
Transverse, 131 to 320°F (55 to 160°C)	0.000053 in/in/°F	0.000096 cm/cm/°C	ISO 11359-2
Transverse, 73 to 131°F (23 to 55°C), 0.0787 in (2.00 mm)	0.000047 in/in/°F	0.000085 cm/cm/°C	ISO 11359-2

Rynite® FR543 NC010
DuPont Engineering Polymers - Polyethylene Terephthalate

Electrical	Nominal Value (English)	Nominal Value (SI)	Test Method
Surface Resistivity			
--	1.0E+13 ohms	1.0E+13 ohms	ASTM D257
--	1.0E+15 ohms	1.0E+15 ohms	IEC 60093
Volume Resistivity			
--	1.0E+15 ohm-cm	1.0E+15 ohm-cm	ASTM D257
--	> 1.0E+15 ohm-cm	> 1.0E+15 ohm-cm	IEC 60093
Dielectric Strength ³			ASTM D149
73°F (23°C), 0.0630 in (1.60 mm), in Oil	597 V/mil	23.5 kV/mm	
73°F (23°C), 0.126 in (3.20 mm), in Oil	432 V/mil	17.0 kV/mm	
203°F (95°C), 0.0630 in (1.60 mm), in Oil	546 V/mil	21.5 kV/mm	
203°F (95°C), 0.126 in (3.20 mm), in Oil	406 V/mil	16.0 kV/mm	
302°F (150°C), 0.0630 in (1.60 mm), in Oil	343 V/mil	13.5 kV/mm	
302°F (150°C), 0.126 in (3.20 mm), in Oil	305 V/mil	12.0 kV/mm	
Dielectric Constant			
73°F (23°C), 1000 Hz	4.100	4.100	ASTM D150
73°F (23°C), 1E+6 Hz	4.100	4.100	ASTM D150
73°F (23°C), 1E+6 Hz	4.10	4.10	IEC 60250
Dissipation Factor			
73°F (23°C), 1000 Hz	0.0090	0.0090	ASTM D150
73°F (23°C), 1E+6 Hz	0.017	0.017	ASTM D150
73°F (23°C), 1E+6 Hz	0.0170	0.0170	IEC 60250
Comparative Tracking Index	250 V	250 V	IEC 60112
Flammability	Nominal Value (English)	Nominal Value (SI)	Test Method
Flame Rating - UL			UL 94
0.0319 in (0.810 mm)	V-0	V-0	
0.0591 in (1.50 mm)	• V-0	• V-0	
	• 5VA	• 5VA	
0.118 in (3.00 mm)	V-0	V-0	
Flammability Classification			IEC 60695-11-10, -20
0.0319 in (0.810 mm)	V-0	V-0	
0.0591 in (1.50 mm)	• V-0	• V-0	
	• 5VA	• 5VA	
0.118 in (3.00 mm)	V-0	V-0	
Oxygen Index	35 %	35 %	ASTM D2863 ISO 4589-2

Rynite® FR543 NC010
DuPont Engineering Polymers - Polyethylene Terephthalate

UL 746	Nominal Value (English)	Nominal Value (SI)	Test Method
RTI Str			UL 746
0.0319 in (0.810 mm)	311 °F	155 °C	
0.0591 in (1.50 mm)	311 °F	155 °C	
0.118 in (3.00 mm)	311 °F	155 °C	
RTI Imp			UL 746
0.0319 in (0.810 mm)	311 °F	155 °C	
0.0591 in (1.50 mm)	311 °F	155 °C	
0.118 in (3.00 mm)	311 °F	155 °C	
RTI Elec			UL 746
0.0319 in (0.810 mm)	311 °F	155 °C	
0.0591 in (1.50 mm)	311 °F	155 °C	
0.118 in (3.00 mm)	311 °F	155 °C	
Comparative Tracking Index (CTI)			UL 746
0.118 in (3.00 mm)	275 V	275 V	

Additional Information	Nominal Value (English)	Nominal Value (SI)
Additional Properties (Drying Recommended)	Yes	Yes

Processing Information		
Injection	Nominal Value (English)	Nominal Value (SI)
Drying Temperature	248 °F	120 °C
Drying Time	4.0 hr	4.0 hr
Suggested Max Moisture	0.020 %	0.020 %
Processing (Melt) Temp	518 to 554 °F	270 to 290 °C
Mold Temperature	> 203 °F	> 95.0 °C
Melt Temperature, Optimum	536 °F	280 °C
Mold Temperature, Optimum	230 °F	110 °C

Notes

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

² Annealed

³ Method A (Short-Time), 500 V/sec