Rynite® FR515 NC010

THERMOPLASTIC POLYESTER RESIN

Common features of Rynite® thermoplastic polyester include mechanical and physical properties such as excellent balance of strength and stiffness, dimensional stability, creep resistance, heat resistance, high surface gloss and good inherent electrical properties at elevated temperature. It can be processed over a broad temperature range and has excellent flow properties.

Rynite® thermoplastic polyester resins are typically used in demanding applications in the automotive, electrical and electronics, appliances where they successfully replace metals and thermosets, as well as other thermoplastic polymers.

Rynite® FR515 NC010 is a 15% glass reinforced, flame retardant modified polyethylene terephthalate resin.

Product information

Resin Identification	PET-GF15FR(17)	ISO 1043
Part Marking Code	>PET-GF15FR(17)<	ISO 11469

Rheological properties

Moulding shrinkage, parallel	0.3	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.8	%	ISO 294-4, 2577
Moulding shrinkage, parallel, annealed	0.5	%	ISO 294-4
Moulding shrinkage, normal, annealed	1.15	%	ISO 294-4
Postmoulding shrinkage, normal, 48h at 80°C	0.25	%	ISO 294-4
Postmoulding shrinkage, parallel, 48h at 80°C	0.1	%	ISO 294-4

Typical mechanical properties

Tensile Modulus	6800	MPa	ISO 527-1/-2
Stress at break	107	MPa	ISO 527-1/-2
Strain at break	2.6	%	ISO 527-1/-2
Flexural Modulus	5940	MPa	ISO 178
Flexural Strength	170	MPa	ISO 178
Compressive strength	170	MPa	ISO 604
Shear Strength	50	MPa	ASTM D 732
Charpy impact strength, 23°C	40	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	35	kJ/m²	ISO 179/1eU
Charpy impact strength, -40°C	20	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	8	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	7	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40°C	7	kJ/m²	ISO 179/1eA
Hardness, Rockwell, M-scale	88	-	ISO 2039-2
Hardness, Rockwell, R-scale	120	-	ISO 2039-2
Poisson's ratio	0.35	-	

Rynite® FR515 NC010

THERMOPLASTIC POLYESTER RESIN

Thermal properties

Melting temperature, 10°C/min	254	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	200	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	240	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h, 50N	210	°C	ISO 306
CLTE, Parallel, -40-23°C	33	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel	18	E-6/K	ISO 11359-1/-2
CLTE, Parallel, 55-160°C	12	E-6/K	ISO 11359-1/-2
CLTE, Normal, -40-23°C	70	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	88	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, Normal, 55-160°C	105	E-6/K	ISO 11359-1/-2
Thermal conductivity solid	0.25	W/(m K)	
RTI, electrical, 0.75mm	140	°C	UL 746B
RTI, electrical, 1.5mm	140	°C	UL 746B
RTI, electrical, 3mm	140	°C	UL 746B
RTI, impact, 0.75mm	140	°C	UL 746B
RTI, impact, 1.5mm	140	°C	UL 746B
RTI, impact, 3mm	140	°C	UL 746B
RTI, strength, 0.75mm	140	°C	UL 746B
RTI, strength, 1.5mm	140	°C	UL 746B
RTI, strength, 3mm	140	°C	UL 746B

Flammability

Burning Behav. at thickness h	V-0	class	IEC 60695-11-10
Thickness tested	0.86	mm	IEC 60695-11-10
UL recognition	yes	-	UL 94
Burning Behav. 5V at thickness h	5VA	class	IEC 60695-11-20
Thickness tested	1.5	mm	IEC 60695-11-20
UL recognition	yes	-	UL 94
Oxygen index	32	%	ISO 4589-1/-2
Glow Wire Flammability Index, 3mm	960	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 3mm	875	°C	IEC 60695-2-13
Glow Wire Temperature, No Flame, 1mm	750	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 2mm	650	°C	IEC 60335-1
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<80[1]	mm/min	ISO 3795 (FMVSS 302)

[1]: DNI

Electrical properties

Relative permittivity, 100Hz	3.8	-	IEC 62631-2-1
Relative permittivity, 1MHz	3.5	-	IEC 62631-2-1
Dissipation factor, 100Hz	90	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	150	E-4	IEC 62631-2-1
Volume resistivity	>1E13	Ohm.m	IEC 62631-3-1

Rynite® FR515 NC010

THERMOPLASTIC POLYESTER RESIN

Surface resistivity	1E13	Ohm	IEC 62631-3-2
Electric strength	34	kV/mm	IEC 60243-1
Comparative tracking index	225	-	IEC 60112
Comparative tracking index	3	PLC	UL 746A
Electric Strength, Short Time, 23°C, 2mm	26	kV/mm	IEC 60243-1

Other properties

Density	1530	kg/m³	ISO 1183

Injection

Drying Recommended	yes	
Drying Temperature	120	°C
Drying Time, Dehumidified Dryer	4 - 6	h
Processing Moisture Content	≤0.02[2]	%
Melt Temperature Optimum	280	°C
Min. melt temperature	270	°C
Max. melt temperature	290	°C
Max. screw tangential speed	0.2	m/s
Mold Temperature Optimum	110	°C
Min. mould temperature	100	°C
Max. mould temperature	120[3]	°C
Hold pressure range	≥80	MPa
Hold pressure time	4	s/mm
Back pressure	As low as possible	MPa
Ejection temperature	170	°C

[2]: At levels above 0.02%, strength and toughness will decrease, even though parts may not exhibit surface defects.

[3]: (6mm - 1mm thickness)

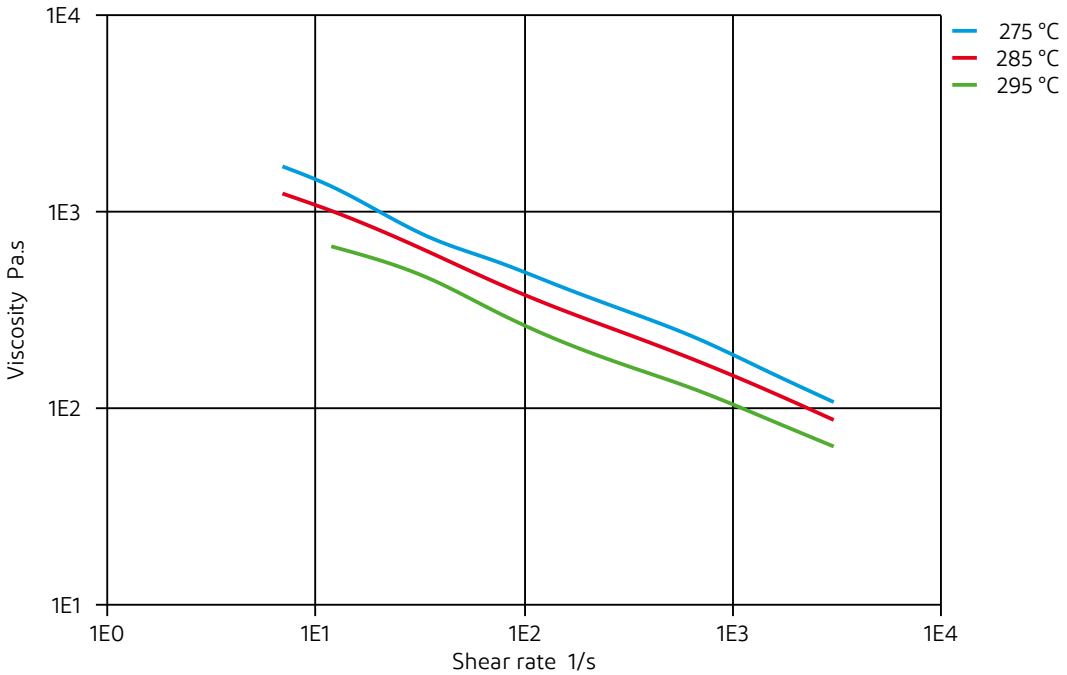
Characteristics

Additives	Release agent, Flame retardant

Rynite® FR515 NC010

THERMOPLASTIC POLYESTER RESIN

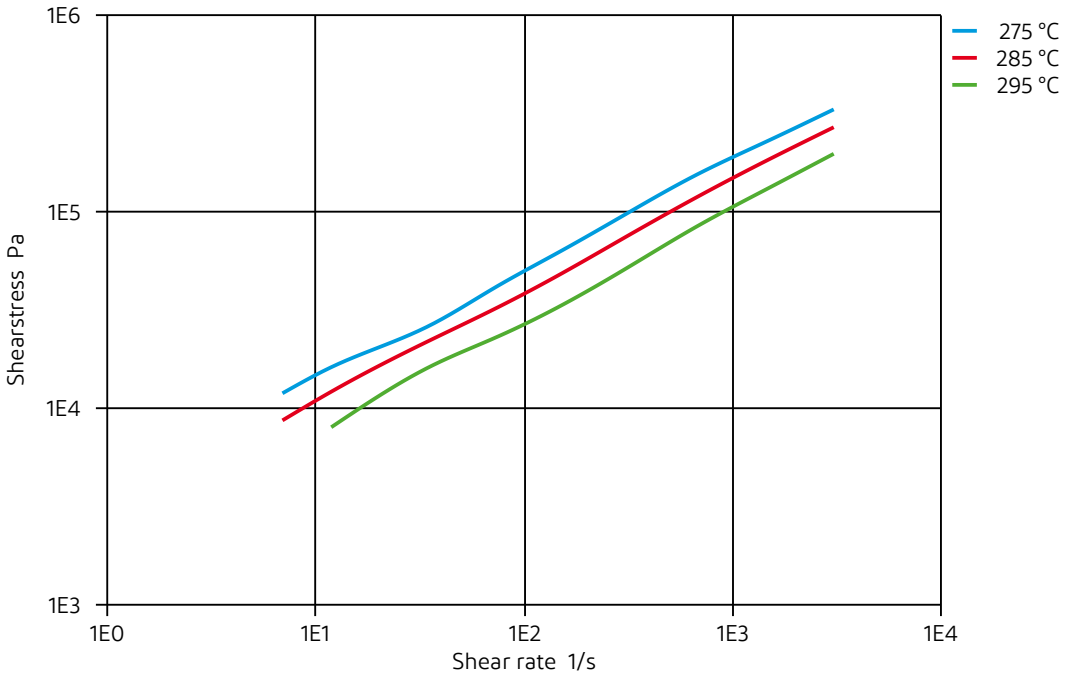
Viscosity-shear rate



Rynite® FR515 NC010

THERMOPLASTIC POLYESTER RESIN

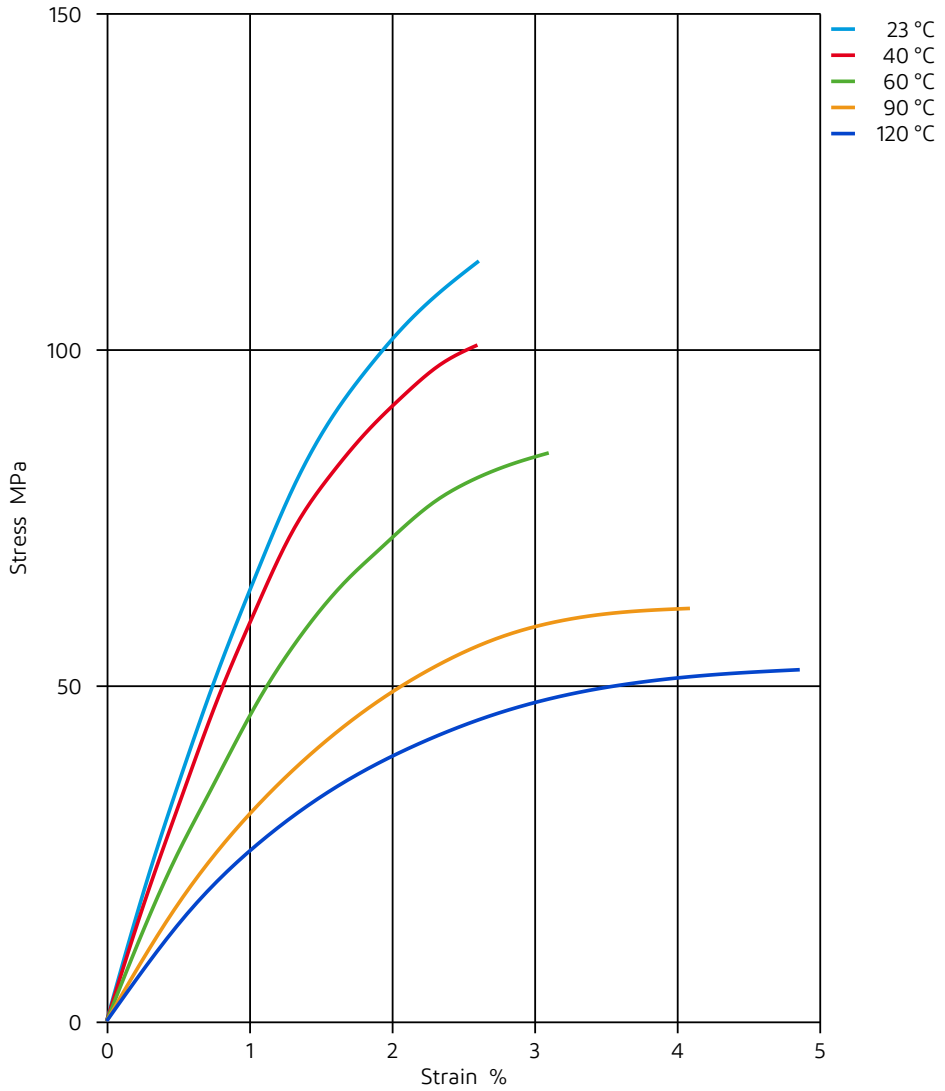
Shearstress-shear rate



Rynite® FR515 NC010

THERMOPLASTIC POLYESTER RESIN

Stress-strain



Rynite® FR515 NC010

THERMOPLASTIC POLYESTER RESIN

Secant modulus-strain