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

Product information

Resin Identification	PET-(MD+GF)35	ISO 1043
Part Marking Code	>PET-(MD+GF)35<	ISO 11469

Rheological properties

Moulding shrinkage, parallel	0.3	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.7	%	ISO 294-4, 2577

Typical mechanical properties

Tensile modulus	10200	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	85	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	2	%	ISO 527-1/-2
Flexural modulus	9100	MPa	ISO 178
Compressive strength	140	MPa	ISO 604
Tensile creep modulus, 1h	9350	MPa	ISO 899-1
Tensile creep modulus, 1000h	7690	MPa	ISO 899-1
Charpy impact strength, 23°C	25	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	20	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	6	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	4	kJ/m²	ISO 179/1eA
Hardness, Rockwell, M-scale	75		ISO 2039-2
Hardness, Rockwell, R-scale	115		ISO 2039-2
Poisson's ratio	0.34		

Thermal properties

Melting temperature, 10°C/min	252	°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	200	°C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	235	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N	205	°C	ISO 306
Coeff. of linear therm. expansion, parallel, -40-23°C	26	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), parallel	16	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, -40-23°C	53	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	52	E-6/K	ISO 11359-1/-2
Thermal conductivity, flow	0.26	W/(m K)	ISO 22007-2

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THERMOPLASTIC POLYESTER RESIN

Thermal conductivity of melt	0.32	W/(m K)	ISO 22007-2
Effective thermal diffusivity, flow	1.4E-7	m²/s	ISO 22007-4
Specific heat capacity of melt	1790	J/(kg K)	ISO 22007-4
RTI, electrical, 0.75mm	140	°C	UL 746B
RTI, electrical, 1.5mm	140	°C	UL 746B
RTI, electrical, 3.0mm	140	°C	UL 746B
RTI, impact, 0.75mm	140	°C	UL 746B
RTI, impact, 1.5mm	140	°C	UL 746B
RTI, impact, 3.0mm	140	°C	UL 746B
RTI, strength, 0.75mm	140	°C	UL 746B
RTI, strength, 1.5mm	140	°C	UL 746B
RTI, strength, 3.0mm	140	°C	UL 746B

Flammability

Burning Behav. at 1.5mm nom. thickn.	HB	class	IEC 60695-11-10
Thickness tested	1.5	mm	IEC 60695-11-10
UL recognition	yes		UL 94
Burning Behav. at thickness h	HB	class	IEC 60695-11-10
Thickness tested	0.75	mm	IEC 60695-11-10
UL recognition	yes		UL 94
Oxygen index	21	%	ISO 4589-1/-2
Glow Wire Flammability Index, 0.75mm	775	°C	IEC 60695-2-12
Glow Wire Flammability Index, 1.5mm	775	°C	IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	825	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 0.75mm	800	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 1.5mm	800	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 3.0mm	850	°C	IEC 60695-2-13
Glow Wire Temperature, No Flame, 0.75mm	750	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 1mm	750	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 1.5mm	750	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 3mm	850	°C	IEC 60335-1
FMVSS Class	B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<80	mm/min	ISO 3795 (FMVSS 302)

Electrical properties

Relative permittivity, 100Hz	4.5		IEC 62631-2-1
Relative permittivity, 1MHz	4.1		IEC 62631-2-1
Dissipation factor, 100Hz	300	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	140	E-4	IEC 62631-2-1
Volume resistivity	1E13	Ohm.m	IEC 62631-3-1
Surface resistivity	1E14	Ohm	IEC 62631-3-2
Electric strength	39	kV/mm	IEC 60243-1
Comparative tracking index	300		IEC 60112

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Physical/Other properties

Humidity absorption, 2mm	0.13	%	Sim. to ISO 62
Water absorption, 2mm	0.83	%	Sim. to ISO 62
Density	1580	kg/m³	ISO 1183
Density of melt	1320	kg/m³	

VDA Properties

Fogging, G-value (condensate)	0.1	mg	ISO 6452

Injection

Drying Recommended	yes	
Drying Temperature	120	°C
Drying Time, Dehumidified Dryer	4 - 6	h
Processing Moisture Content	≤0.02[1]	%
Melt Temperature Optimum	285	°C
Min. melt temperature	280	°C
Max. melt temperature	300	°C
Screw tangential speed	≤0.2	m/s
Mold Temperature Optimum	110	°C
Min. mould temperature	100	°C
Max. mould temperature	120[2]	°C
Hold pressure range	≥80	MPa
Hold pressure time	4	s/mm
Back pressure	As low as possible	MPa
Ejection temperature	170	°C

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

[2]: (6mm - 1mm thickness)

Characteristics

Processing	Injection Moulding
Delivery form	Pellets
Additives	Release agent
Special characteristics	Low Warpage

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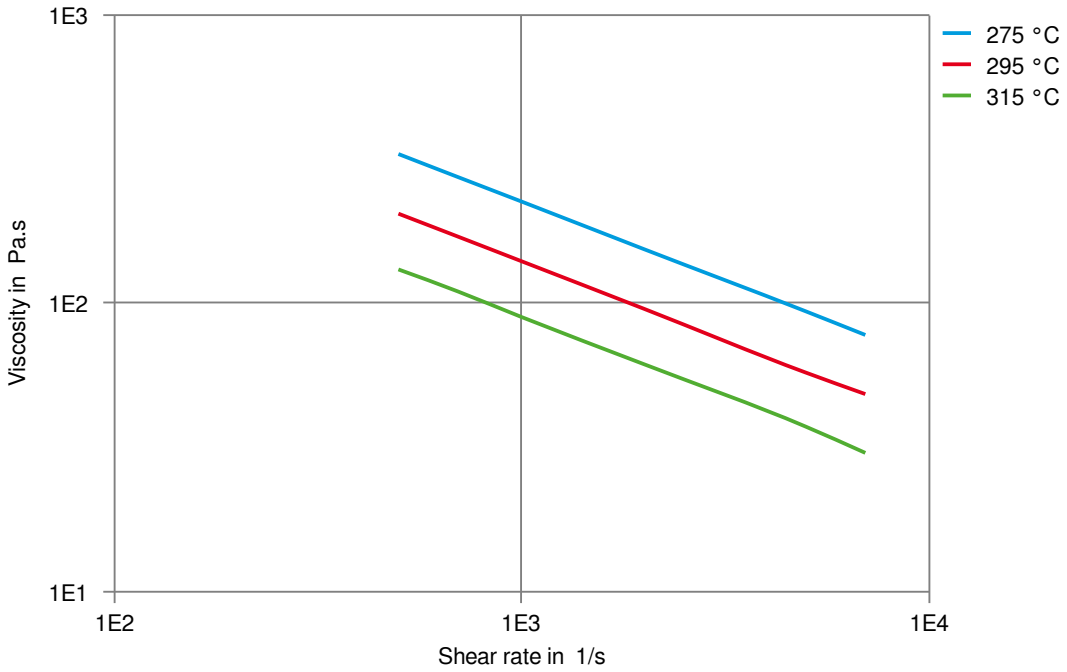
Viscosity-shear rate



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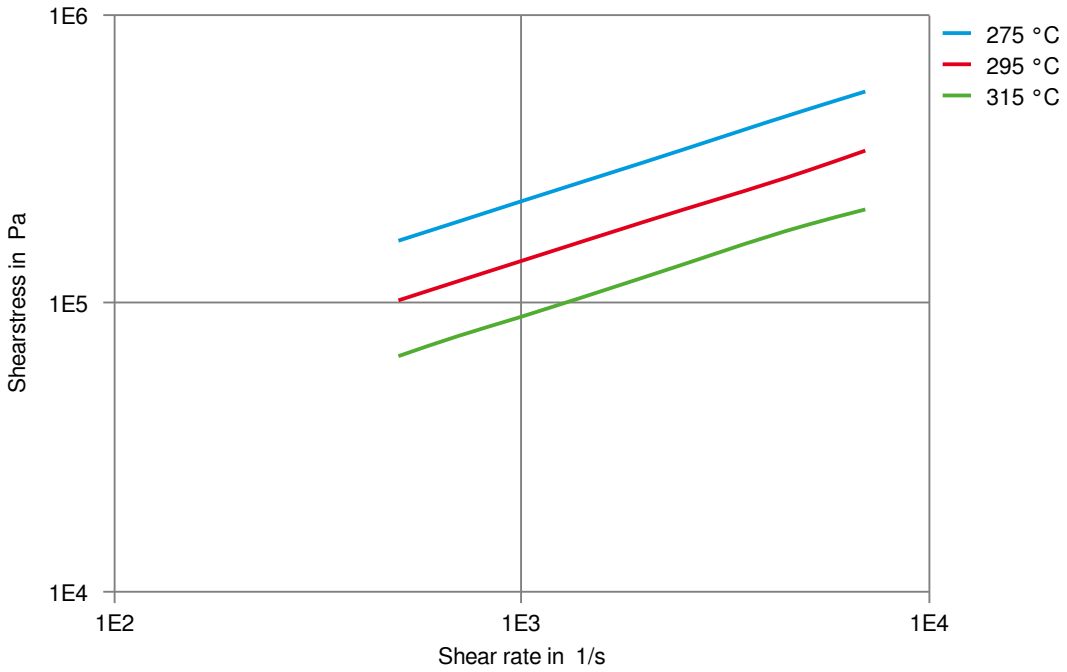
Shearstress-shear rate



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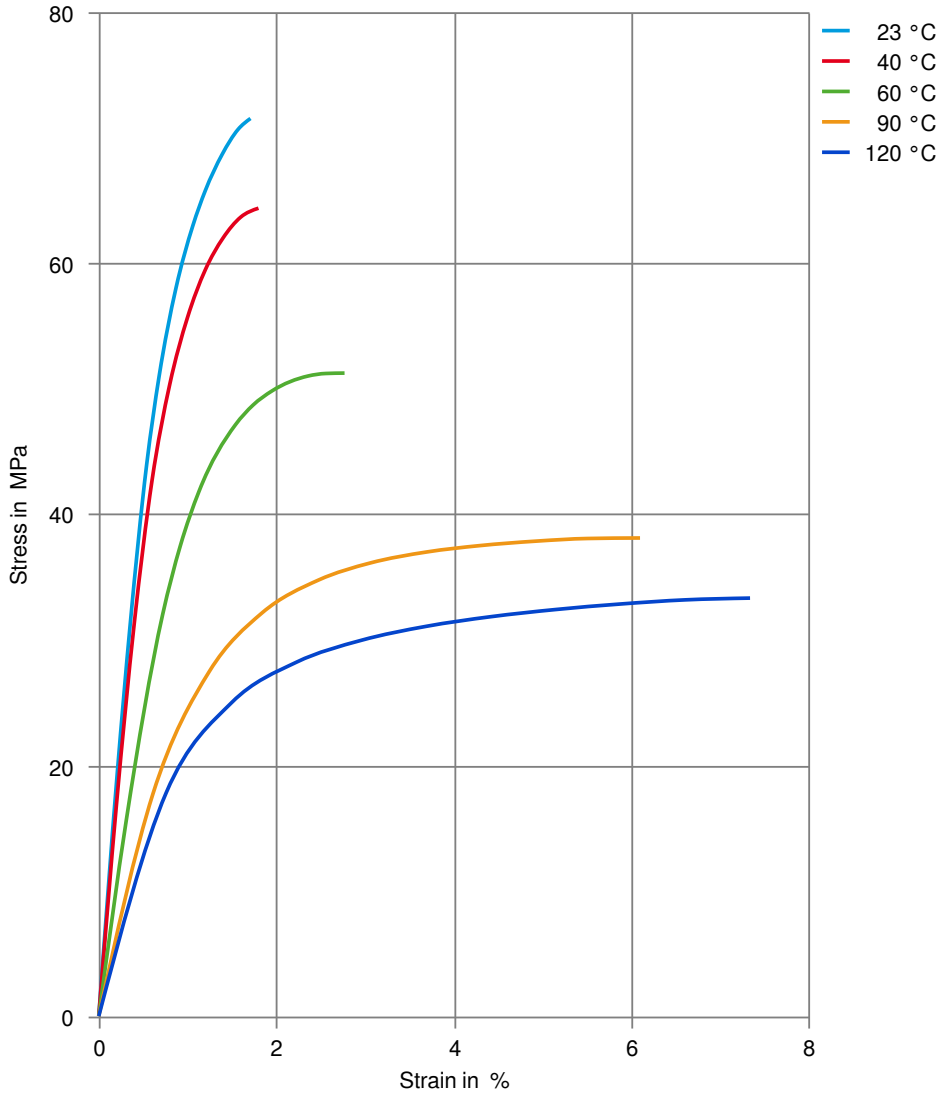
Stress-strain



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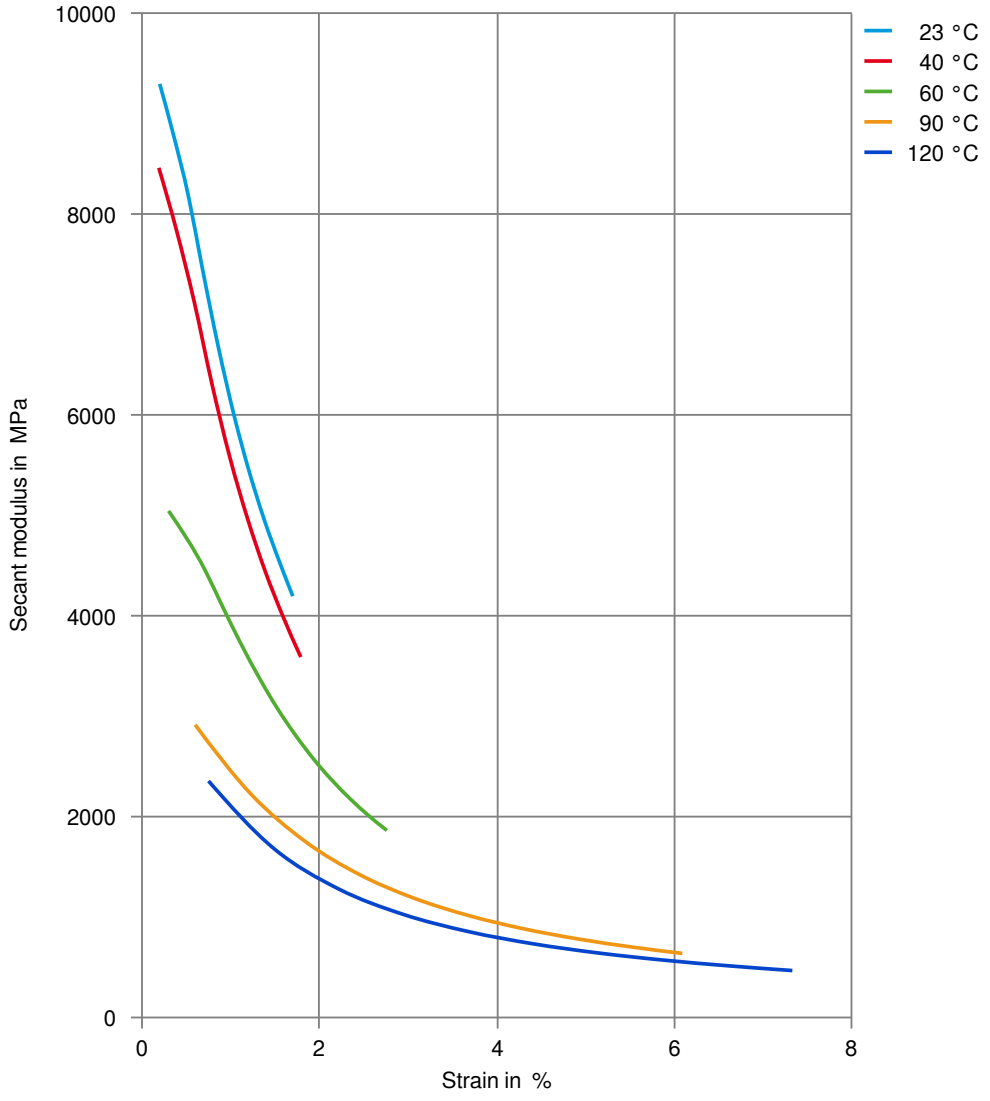
Secant modulus-strain



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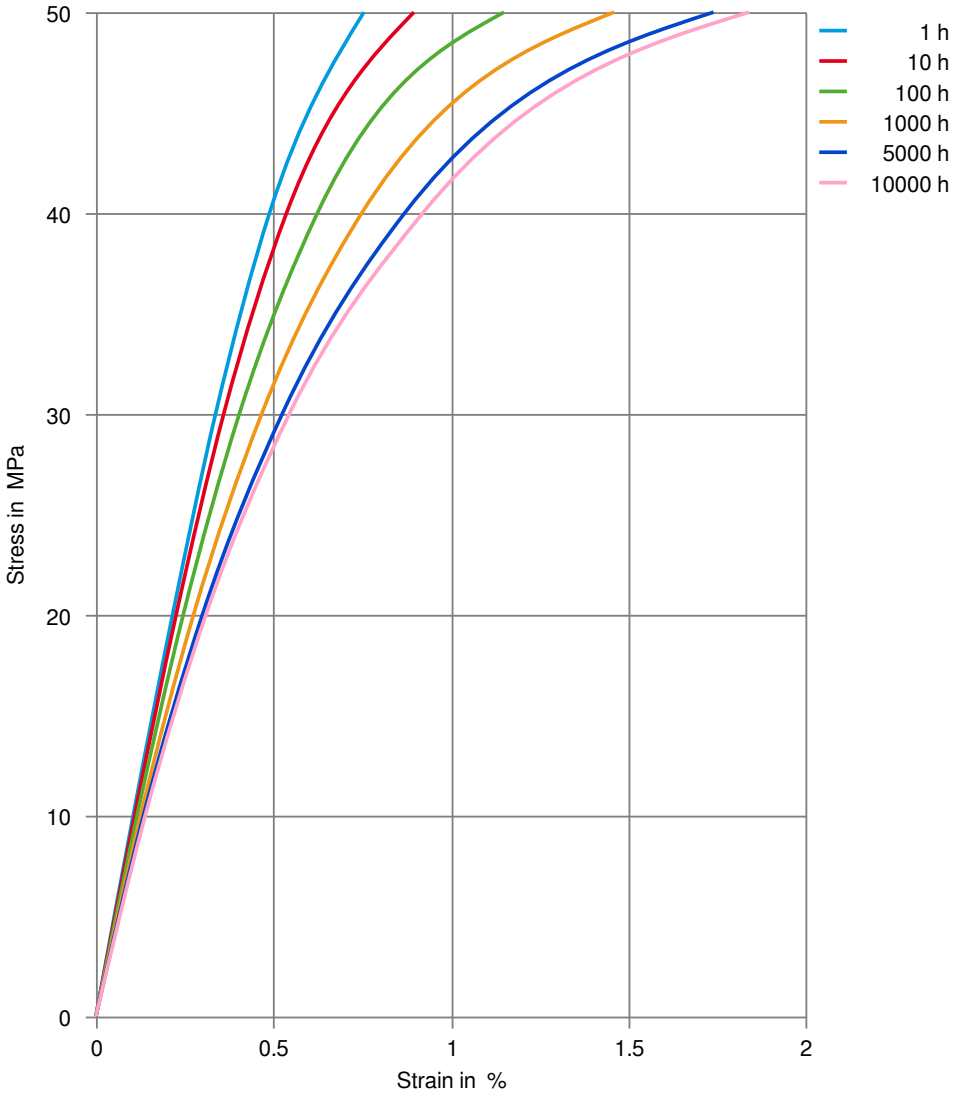
Stress-strain (isochronous) 23 °C



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Creep modulus-time 23 °C