Celanese
The chemistry inside innovation™

Crastin® SK641FR NC010

THERMOPLASTIC POLYESTER RESIN

Common features of Crastin® thermoplastic polyester resin include mechanical and physical properties such as stiffness and toughness, heat resistance, friction and wear resistance, excellent surface finishes and good colourability. Crastin® thermoplastic polyester resin has excellent electrical insulation characteristics and high arc-resistant grades are available. Many flame retardant grades have UL recognition (class V-0). Crastin® thermoplastic polyester resin typically has high chemical and heat ageing resistance.

The good melt stability of Crastin® thermoplastic polyester resin normally enables the recycling of properly handled production waste. If recycling is not possible, we recommend, as the preferred option, incineration with energy recovery (-24 kJ/g of base polymer) in appropriately equipped installations. For disposal, local regulations have to be observed.

Crastin® thermoplastic polyester resin typically is used in demanding applications in the electronics, electrical, automotive, mechanical engineering, chemical, domestic appliances and sporting goods industry.

Crastin® SK641FR is a flame retardant, 10% glass reinforced polybutylene terephtalate moulding resin. It is recognized as UL94 V-0 at 1.5mm.

Product information

Resin Identification	PBT-GF10FR(17)	ISO 1043
Part Marking Code	>PBT-GF10FR(17)<	ISO 11469

Rheological properties

Melt volume-flow rate	12.5	cm^3/10min	ISO 1133
Melt mass-flow rate	17	g/10min	ISO 1133
Temperature	250	°C	
Load	2.16	kg	
Melt mass-flow rate, Temperature	250	°C	
Melt mass-flow rate, Load	2.16	kg	
Viscosity number	110	cm^3/g	ISO 307, 1157, 1628
Moulding shrinkage, parallel	0.8	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.3	%	ISO 294-4, 2577
Postmoulding shrinkage, normal, 48h at 80°C	0.3	%	ISO 294-4
Postmoulding shrinkage, parallel, 48h at 80°C	0.15	%	ISO 294-4

Typical mechanical properties

Tensile Modulus	6000	MPa	ISO 527-1/-2
Stress at break, 5mm/min	93	MPa	ISO 527-1/-2
Strain at break, 5mm/min	3.6	%	ISO 527-1/-2
Tensile creep modulus, 1h	4600	MPa	ISO 899-1
Tensile creep modulus, 1000h	3500	MPa	ISO 899-1
Charpy impact strength, 23°C	50	kJ/m^2	ISO 179/1eU
Charpy impact strength, -30°C	37	kJ/m^2	ISO 179/1eU
Charpy notched impact strength, 23°C	6.5	kJ/m^2	ISO 179/1eA

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Charpy notched impact strength, -30 °C	4.7	kJ/m²	ISO 179/1eA
Poisson's ratio	0.35		

Thermal properties

Melting temperature, 10 °C/min	225	°C	ISO 11357-1/-3
Glass transition temperature, 10 °C/min	55	°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	215	°C	ISO 75-1/-2
Coeff. of linear therm. expansion, parallel	60	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	110	E-6/K	ISO 11359-1/-2
RTI, electrical, 0.75mm	140	°C	UL 746B
RTI, electrical, 1.5mm	140	°C	UL 746B
RTI, electrical, 3mm	140	°C	UL 746B
RTI, electrical, 6mm	140	°C	UL 746B
RTI, impact, 0.75mm	130	°C	UL 746B
RTI, impact, 1.5mm	130	°C	UL 746B
RTI, impact, 3mm	130	°C	UL 746B
RTI, impact, 6mm	130	°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
RTI, strength, 6mm	140	°C	UL 746B

Flammability

Burning Behav. at 1.5mm nom. thickn.	V-0	class	UL 94
Thickness tested	1.5	mm	UL 94
UL recognition	yes		UL 94
Burning Behav. at thickness h	V-0	class	UL 94
Thickness tested	0.75	mm	UL 94
UL recognition	yes		UL 94
Oxygen index	31	%	ISO 4589-1/-2
FMVSS Class	DNI		ISO 3795 (FMVSS 302)

Electrical properties

Relative permittivity, 100Hz	3.6		IEC 62631-2-1
Dissipation factor, 100Hz	30	E-4	IEC 62631-2-1
Volume resistivity	>1E13	Ohm.m	IEC 62631-3-1
Surface resistivity	1E15	Ohm	IEC 62631-3-2
Electric strength	26	kV/mm	IEC 60243-1
Comparative tracking index	225		IEC 60112

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Other properties

Humidity absorption, 2mm	0.15	%	Sim. to ISO 62
Water absorption, 2mm	0.35	%	Sim. to ISO 62
Density	1540	kg/m³	ISO 1183
Density of melt	1360	kg/m³	Internal

Injection

Drying Recommended	yes		
Drying Temperature	120	°C	
Drying Time, Dehumidified Dryer	2 - 4	h	
Processing Moisture Content	≤0.04	%	
Melt Temperature Optimum	250	°C	Internal
Min. melt temperature	240	°C	
Max. melt temperature	260	°C	
Mold Temperature Optimum	80	°C	
Min. mould temperature	30	°C	
Max. mould temperature	130	°C	
Hold pressure range	≥60	MPa	
Hold pressure time	3	s/mm	
Back pressure	As low as possible	MPa	
Ejection temperature	170	°C	Internal

Characteristics

Additives	Flame retardant

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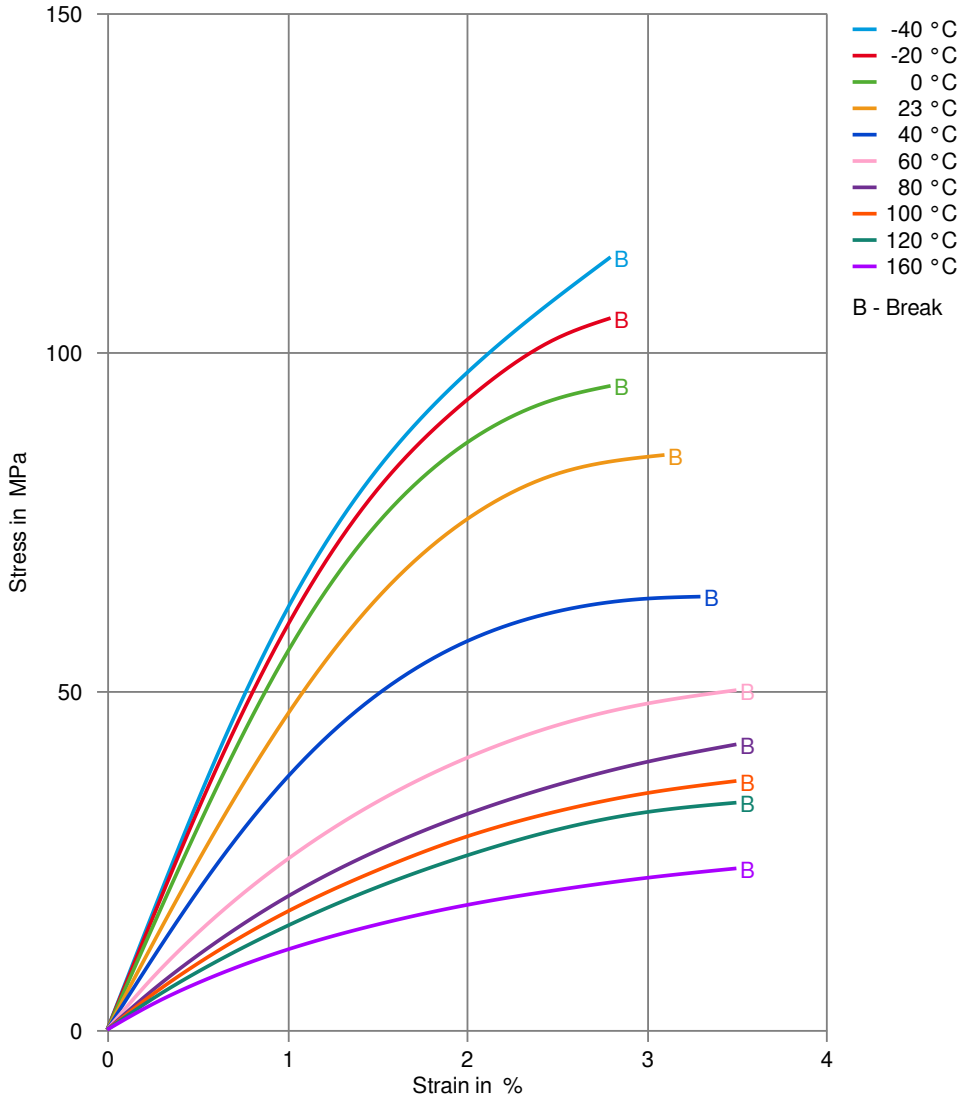
Stress-strain



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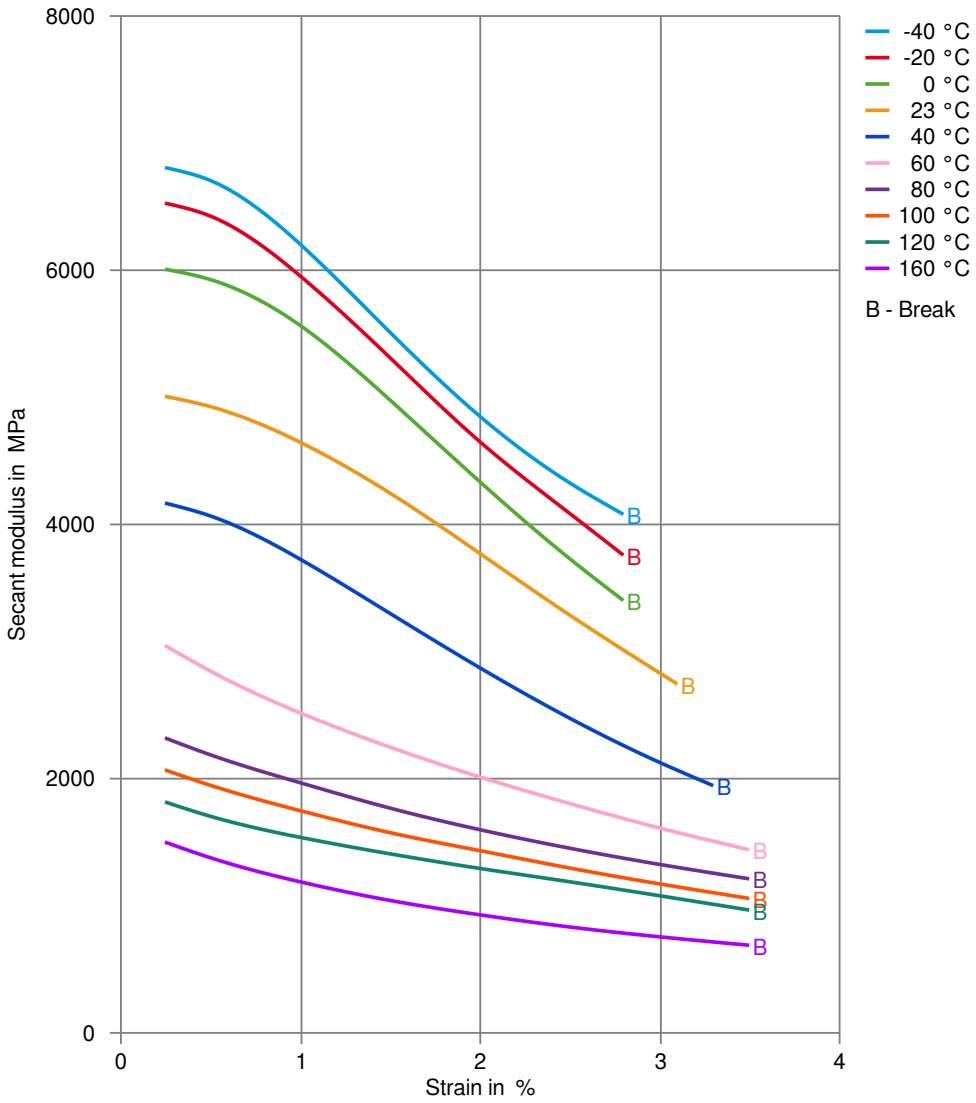
Secant modulus-strain



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Chemical Media Resistance

Acids

- ✔ Acetic Acid (5% by mass), 23°C
- ✔ Citric Acid solution (10% by mass), 23°C
- ✔ Lactic Acid (10% by mass), 23°C
- ✘ Hydrochloric Acid (36% by mass), 23°C
- ✘ Nitric Acid (40% by mass), 23°C
- ✘ Sulfuric Acid (38% by mass), 23°C
- ✘ Sulfuric Acid (5% by mass), 23°C
- ✘ Chromic Acid solution (40% by mass), 23°C

Bases

- ✘ Sodium Hydroxide solution (35% by mass), 23°C
- ✔ Sodium Hydroxide solution (1% by mass), 23°C
- ✔ Ammonium Hydroxide solution (10% by mass), 23°C

Alcohols

- ✔ Isopropyl alcohol, 23°C
- ✔ Methanol, 23°C
- ✔ Ethanol, 23°C

Hydrocarbons

- ✔ n-Hexane, 23°C
- ✔ Toluene, 23°C
- ✔ iso-Octane, 23°C

Ketones

- ✔ Acetone, 23°C

Ethers

- ✔ Diethyl ether, 23°C

Mineral oils

- ✔ SAE 10W40 multigrade motor oil, 23°C
- ✘ SAE 10W40 multigrade motor oil, 130°C
- ✘ SAE 80/90 hypoid-gear oil, 130°C
- ✔ Insulating Oil, 23°C

Standard Fuels

- ✘ ISO 1817 Liquid 1 - E5, 60°C
- ✘ ISO 1817 Liquid 2 - M15E4, 60°C
- ✘ ISO 1817 Liquid 3 - M3E7, 60°C
- ✘ ISO 1817 Liquid 4 - M15, 60°C
- ✔ Standard fuel without alcohol (pref. ISO 1817 Liquid C), 23°C
- ✔ Standard fuel with alcohol (pref. ISO 1817 Liquid 4), 23°C
- ✔ Diesel fuel (pref. ISO 1817 Liquid F), 23°C
- ✔ Diesel fuel (pref. ISO 1817 Liquid F), 90°C
- ✘ Diesel fuel (pref. ISO 1817 Liquid F), >90°C

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Salt solutions

- ✔ Sodium Chloride solution (10% by mass), 23°C
- ✔ Sodium Hypochlorite solution (10% by mass), 23°C
- ✔ Sodium Carbonate solution (20% by mass), 23°C
- ✔ Sodium Carbonate solution (2% by mass), 23°C
- ✔ Zinc Chloride solution (50% by mass), 23°C

Other

- ✔ Ethyl Acetate, 23°C
- ✘ Hydrogen peroxide, 23°C
- ✘ DOT No. 4 Brake fluid, 130°C
- ✘ Ethylene Glycol (50% by mass) in water, 108°C
- ✔ 1% nonylphenoxy-polyethyleneoxy ethanol in water, 23°C
- ✔ 50% Oleic acid + 50% Olive Oil, 23°C
- ✔ Water, 23°C
- ✘ Water, 90°C
- ✔ Phenol solution (5% by mass), 23°C

Symbols used:

✔ possibly resistant
Defined as: Supplier has sufficient indication that contact with chemical can be potentially accepted under the intended use conditions and expected service life. Criteria for assessment have to be indicated (e.g. surface aspect, volume change, property change).

✘ not recommended - see explanation
Defined as: Not recommended for general use. However, short-term exposure under certain restricted conditions could be acceptable (e.g. fast cleaning with thorough rinsing, spills, wiping, vapor exposure).