

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® S600F40 NC010 is an unreinforced, lubricated, low viscosity polybutylene terephthalate resin for injection moulding.

Product information

T TOULOU II IIOITTIALIOIT			
Resin Identification	PBT		ISO 1043
Part Marking Code	>PBT<		ISO 11469
Rheological properties			
	20		100 1100
Melt volume-flow rate		cm ³ /10min	ISO 1133
Temperature	250	-	
Load Mat maga flow rate	2.16	-	100 1100
Melt mass-flow rate		g/10min	ISO 1133
Melt mass-flow rate, Temperature	250	-	
Melt mass-flow rate, Load	2.16		
Viscosity number		cm³/g	ISO 307, 1628
Intrinsic viscosity	0.965	0/	ISO 307, 1628
Moulding shrinkage, parallel	1.6		ISO 294-4, 2577
Moulding shrinkage, normal	1.6	%	ISO 294-4, 2577
Typical mechanical properties			
Tensile modulus	2600	МРа	ISO 527-1/-2
Tensile stress at yield, 50mm/min	58	MPa	ISO 527-1/-2
Tensile strain at yield, 50mm/min	4	%	ISO 527-1/-2
Nominal strain at break	30	%	ISO 527-1/-2
Tensile strain at break, 50mm/min	>50	%	ISO 527-1/-2
Flexural modulus	2400	MPa	ISO 178
Flexural strength	85	MPa	ISO 178
Tensile creep modulus, 1h	2600	MPa	ISO 899-1
Tensile creep modulus, 1000h	1800	MPa	ISO 899-1
Charpy impact strength, 23°C	Ν	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	Ν	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	4	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	4	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C	4	kJ/m ²	ISO 180/1A
Izod notched impact strength, -40°C	4.0	kJ/m ²	ISO 180/1A
Ball indentation hardness, H 961/30	139	MPa	ISO 2039-1

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Poisson's ratio	0.38		
Thermal properties			
Melting temperature, 10 ° C/min	224	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min		°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa		°C	ISO 75-1/-2
Temperature of deflection under load, 1.8 MPa,	60	°C	ISO 75-1/-2
annealed			
Temperature of deflection under load, 0.45 MPa	115		ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa,	180	°C	ISO 75-1/-2
annealed			
Vicat softening temperature, 50°C/h 50N	175		ISO 306
Coefficient of linear thermal expansion	110	E-6/K	ISO 11359-1/-2
(CLTE), parallel	100		
Coefficient of linear thermal expansion (CLTE), normal	120	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.21	W/(m K)	ISO 22007-2
Specific heat capacity of melt		J/(kg K)	ISO 22007-2
RTI, electrical, 0.75mm	130		UL 746B
RTI, electrical, 1.5mm	130		UL 746B
RTI, electrical, 3.0mm	130		UL 746B
RTI, electrical, 6mm	130		UL 746B
RTI, impact, 0.75mm	115	°C	UL 746B
RTI, impact, 1.5mm	115		UL 746B
RTI, impact, 3.0mm	115		UL 746B
RTI, impact, 6mm	115		UL 746B
RTI, strength, 0.75mm	120		UL 746B
RTI, strength, 1.5mm	120		UL 746B
RTI, strength, 3.0mm	120		UL 746B
RTI, strength, 6mm	120	°C	UL 746B
Flammability			
Burning Behav. at 1.5mm nom. thickn.	HB	class	IEC 60695-11-10
Thickness tested		mm	IEC 60695-11-10
UL recognition	yes		UL 94
Burning Behav. at thickness h	•	class	IEC 60695-11-10
Thickness tested	0.75	mm	IEC 60695-11-10
UL recognition	yes		UL 94
Oxygen index	22	%	ISO 4589-1/-2
Glow Wire Flammability Index, 3.0mm	750		IEC 60695-2-12
Glow Wire Ignition Temperature, 0.75mm	750		IEC 60695-2-13
Glow Wire Ignition Temperature, 1.0mm	750		IEC 60695-2-13
Glow Wire Ignition Temperature, 2.0mm	750	°C	IEC 60695-2-13
FMVSS Class	В		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	28	mm/min	ISO 3795 (FMVSS 302)



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Electrical	properties
	p. op 01 100

Relative permittivity, 100Hz Relative permittivity, 1MHz Dissipation factor, 100Hz Dissipation factor, 1MHz Volume resistivity Electric strength Comparative tracking index Arc Resistance Electric Strength, Short Time, 2mm		200 >1E13 26 600 5	E-4 E-4 Ohm.m kV/mm s kV/mm	IEC 62631-2-1 IEC 62631-2-1 IEC 62631-2-1 IEC 62631-2-1 IEC 62631-3-1 IEC 60243-1 IEC 60112 UL 746B IEC 60243-1
Physical/Other properties				
Humidity absorption, 2mm Water absorption, 2mm Density Density of melt				Sim. to ISO 62 Sim. to ISO 62 ISO 1183
VDA Properties				
Odour Fogging, F-value (refraction) Fogging, G-value (condensate)		95	class % mg	VDA 270 ISO 6452 ISO 6452
Injection				
Drying Recommended Drying Temperature Drying Time, Dehumidified Dryer Processing Moisture Content Melt Temperature Optimum Min. melt temperature Max. melt temperature Mold Temperature Optimum Min. mould temperature Max. mould temperature Hold pressure range Hold pressure time Back pressure Ejection temperature		60 130 ≥60	h % °C °C °C °C C MPa s/mm MPa	
Characteristics				
Processing Delivery form	Injection Moulding Pellets			

Release agent

Additives





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Additional information

Injection molding

To minimize the volatile content in the final product, dry the resin to ≤0.01% water content. In injection molding, use the lowest possible melt temperature (recommended 240 °C) and shortest feasible residence time (recommended 2-3 minutes). Store the parts in a ventilated, clean area before use. If assistance is needed please contact your Celanese account representative.

These recommendations are based on internal Celanese testing. For drying and injection molding conditions outside the above parameters, customer must test for and verify suitably low volatiles emissions on molded articles to confirm the final product is suitably pure for its intended use.

Automotive

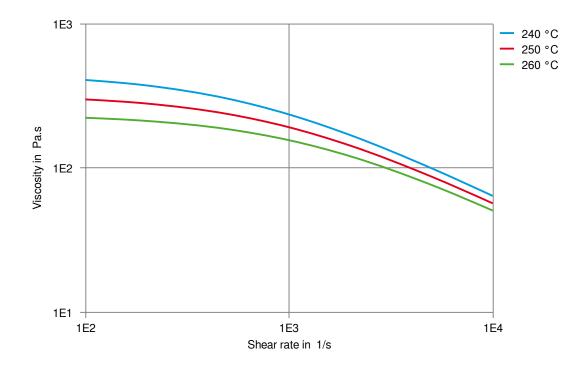
OEM Ford STANDARD WSS-M4D1014-A





THERMOPLASTIC POLYESTER RESIN

Viscosity-shear rate

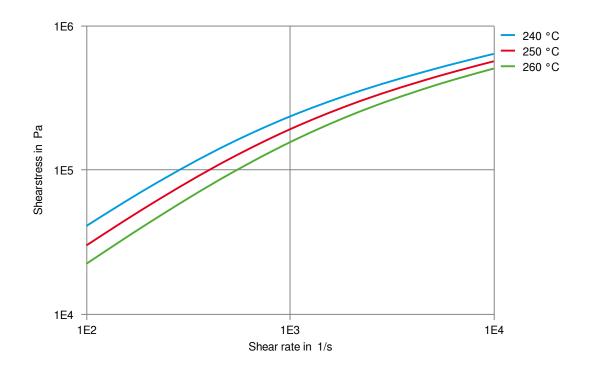






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Shearstress-shear rate

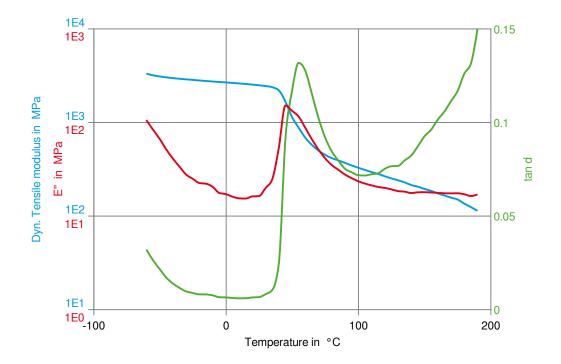






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Dynamic Tensile modulus-temperature (measured on Crastin® S600F20 NC010)

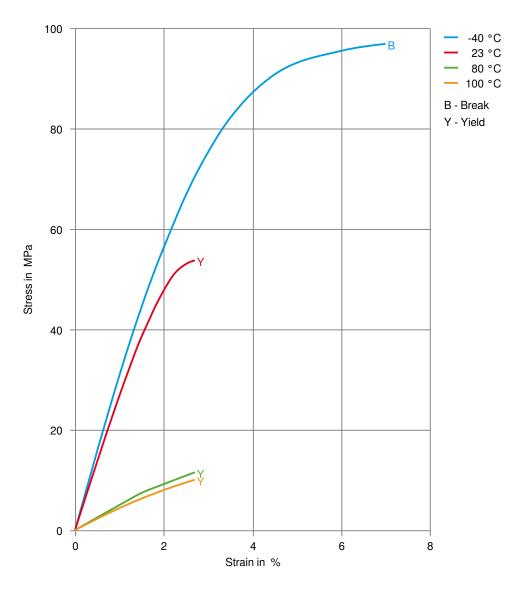






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Stress-strain

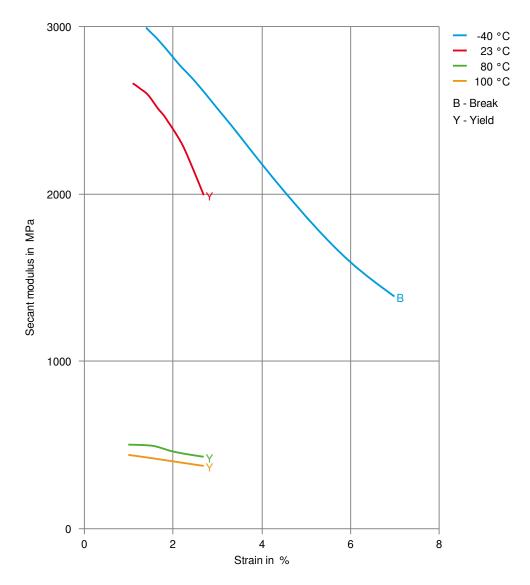






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Secant modulus-strain

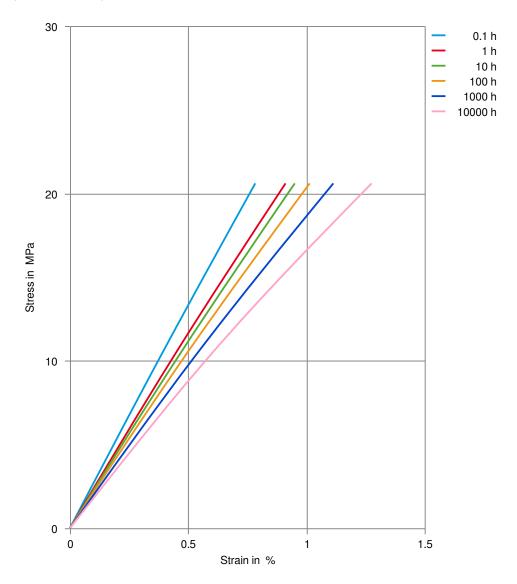






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Stress-strain (isochronous) 23°C

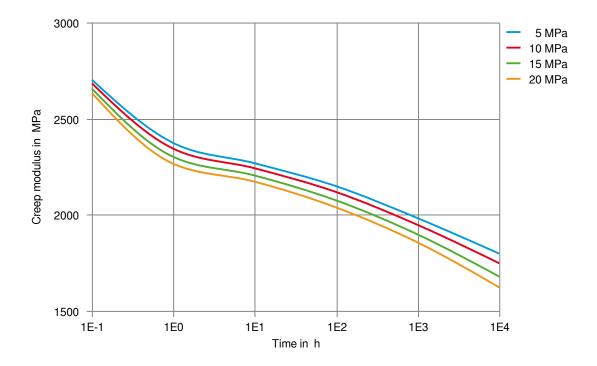






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Creep modulus-time 23°C







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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
- X Nitric Acid (40% by mass), 23°C
- X Sulfuric Acid (38% by mass), 23 °C
- X 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
- X SAE 10W40 multigrade motor oil, 130°C
- X SAE 80/90 hypoid-gear oil, 130 °C
- ✓ Insulating Oil, 23°C

Standard Fuels

- X ISO 1817 Liquid 1 E5, 60°C
- ¥ ISO 1817 Liquid 2 M15E4, 60°C
- X ISO 1817 Liquid 3 M3E7, 60°C
- X 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
- X Diesel fuel (pref. ISO 1817 Liquid F), >90°C

Salt solutions

- ✓ Sodium Chloride solution (10% by mass), 23°C
- Sodium Hypochlorite solution (10% by mass), 23°C

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Crastin[®] S600F40 NC010

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- 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
- X 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).

X 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).

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NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colourants or other additives may cause significant variations in data values. Properties of moulded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design, processing conditions and environmental exposure. Other than those product expressly identified as medical grade (including by MT® product designation or otherwise), Celanese's products are not intended for use in medical or dental implants. Regardless of any such product designation, any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use. To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such investigate whether any existing patents are infringed by the use of the materials mentioned in this publication. Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards. We strongly recommend that users s

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