

ISO 1043

ISO 11469

## Crastin® 6129 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.

PBT

>PBT<

Crastin® 6129 is an unreinforced, high viscosity polybutylene terephthalate for extrusion and injection moulding.

## Product information Resin Identification

Part Marking Code

Rheological properties	
Melt volume-flow rate 8	cm <sup>3</sup> /10min ISO 1133
Melt mass-flow rate 10	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 150	cm³/g ISO 307, 1628
Intrinsic viscosity 1.2	ISO 307, 1628
Moulding shrinkage, parallel 1.7	% ISO 294-4, 2577
Moulding shrinkage, normal 1.5	% ISO 294-4, 2577
Postmoulding shrinkage, normal, 48h at 80°C 0.6	% ISO 294-4
Postmoulding shrinkage, parallel, 48h at 80°C 0.3	% ISO 294-4

### Typical mechanical properties

1 1			
Tensile modulus 260	0	MPa	ISO 527-1/-2
Tensile stress at yield, 50mm/min	8	MPa	ISO 527-1/-2
Tensile strain at yield, 50mm/min	5	%	ISO 527-1/-2
Nominal strain at break >	0	%	ISO 527-1/-2
Tensile strain at break, 50mm/min	)0	%	ISO 527-1/-2
Flexural modulus 240	)0	MPa	ISO 178
Flexural strength	}5	MPa	ISO 178
Tensile creep modulus, 1h 250	)0	MPa	ISO 899-1
Tensile creep modulus, 1000h	)0	MPa	ISO 899-1
Charpy impact strength, 23°C	Ν	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	Ν	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, 23°C	.5	kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -30°C	4	kJ/m²	ISO 179/1eA
Ball indentation hardness, H 961/30	39	MPa	ISO 2039-1

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## THERMOPLASTIC POLYESTER RESIN

Poisson's ratio	0.38		
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
Temperature of deflection under load, 1.8 MPa	50	°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
Vicat softening temperature, 50 °C/h 10N	215		ISO 306
Coefficient of linear thermal expansion	130	E-6/K	ISO 11359-1/-2
(CLTE), parallel		= - " (	100
Coefficient of linear thermal expansion (CLTE),	130	E-6/K	ISO 11359-1/-2
normal	0.05	141// 17)	100 00007 0
Thermal conductivity of melt		W/(m K)	ISO 22007-2
Specific heat capacity of melt		J/(kg K)	ISO 22007-4
RTI, electrical, 1.5mm		°C °C	UL 746B
RTI, electrical, 3.0mm		°C	UL 746B UL 746B
RTI, impact, 1.5mm RTI, impact, 3.0mm		°C	UL 746B
RTI, strength, 1.5mm		°C	UL 746B
RTI, strength, 3.0mm		°C	UL 746B
-	7.0	J	027105
Flammability			
Burning Behav. at 1.5mm nom. thickn.		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		mm	IEC 60695-11-10
UL recognition	yes	0/	UL 94
Oxygen index	22		ISO 4589-1/-2 IEC 60695-2-12
Glow Wire Flammability Index, 1.5mm	960 850		IEC 60695-2-12 IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	825		IEC 60695-2-12
Glow Wire Ignition Temperature, 0.75mm Glow Wire Ignition Temperature, 0.4mm	825 825	_	IEC 60695-2-13
Glow Wire Ignition Temperature, 0.4mm	825		IEC 60695-2-12
Glow Wire Ignition Temperature, 1.5mm	825		IEC 60695-2-13
Glow Wire Ignition Temperature, 1.5mm	825		IEC 60695-2-13
Glow Wire Ignition Temperature, 3.0mm	825		IEC 60695-2-13
FMVSS Class	823 B	Ü	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm		mm/min	ISO 3795 (FMVSS 302)
Hot Wire Ignition, 1.5mm	15		UL 746A
Hot Wire Ignition, 3mm	30		UL 746A
	30	-	32, 10/1

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### THERMOPLASTIC POLYESTER RESIN

### **Electrical properties**

Relative permittivity, 1MHz	3.2		IEC 62631-2-1
Dissipation factor, 1MHz	200	E-4	IEC 62631-2-1
Volume resistivity	>1E13	Ohm.m	IEC 62631-3-1
Surface resistivity	1E12	Ohm	IEC 62631-3-2
Electric strength	26	kV/mm	IEC 60243-1
Comparative tracking index	600		IEC 60112
Electric Strength, Short Time, 2mm	15	kV/mm	IEC 60243-1

### Physical/Other properties

Humidity absorption, 2mm	0.2 %	Sim. to ISO 62
Water absorption, 2mm	0.4 %	Sim. to ISO 62
Density	1320 kg/m <sup>3</sup>	ISO 1183
Density of melt	1120 kg/m <sup>3</sup>	

### **VDA** Properties

Emission of organic compounds	150 μgC/g	VDA 277

## 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 May mould temperature	30	h % °C °C °C °C
Min. mould temperature  Max. mould temperature	130	_
Hold pressure range	≥60	MPa
Hold pressure time	4	s/mm
Back pressure	As low as possible	MPa
Ejection temperature	170	°C

### Extrusion

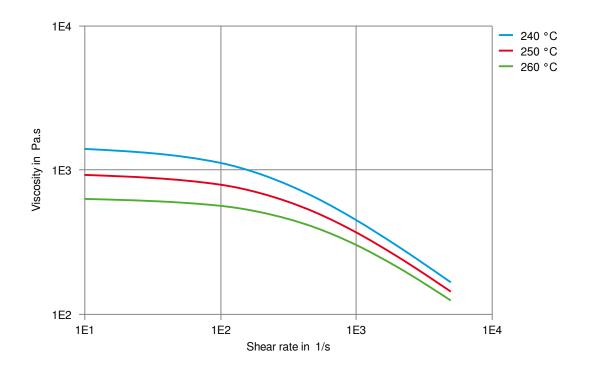
Drying Temperature	110 - 130	°C
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.04	%
Melt Temperature Optimum	250	°C
Melt Temperature Range	240 - 260	°C

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## THERMOPLASTIC POLYESTER RESIN

Viscosity-shear rate

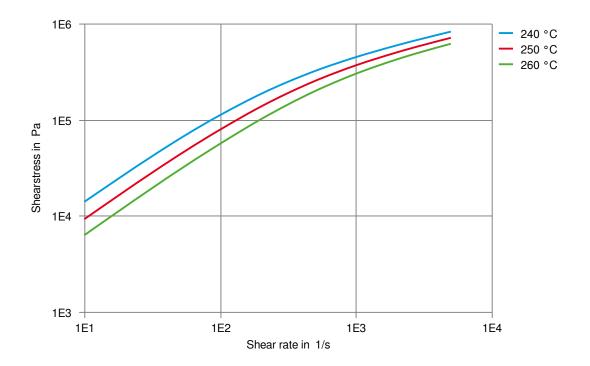


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### THERMOPLASTIC POLYESTER RESIN

Shearstress-shear rate

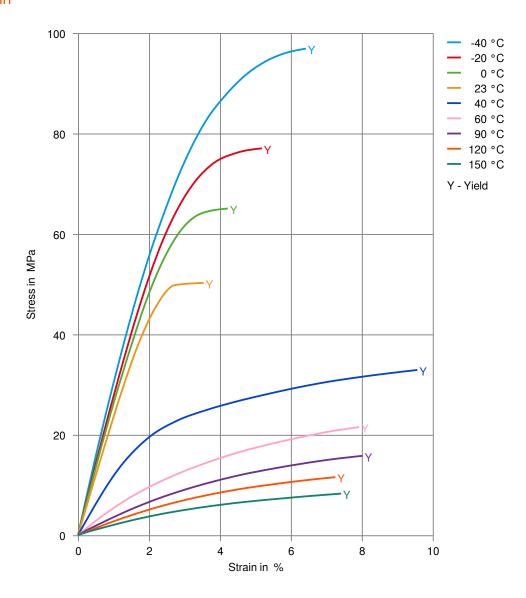


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## THERMOPLASTIC POLYESTER RESIN

### Stress-strain

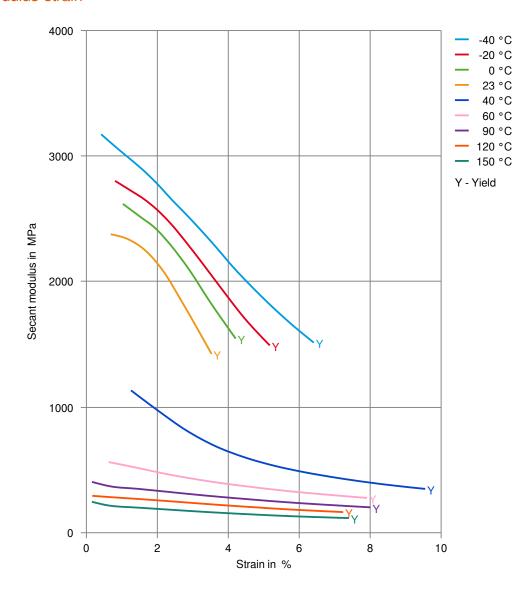


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### THERMOPLASTIC POLYESTER RESIN

### Secant modulus-strain

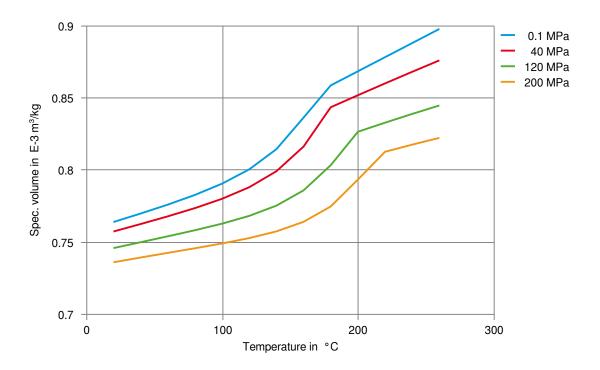


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## THERMOPLASTIC POLYESTER RESIN

Specific volume-temperature (pvT)

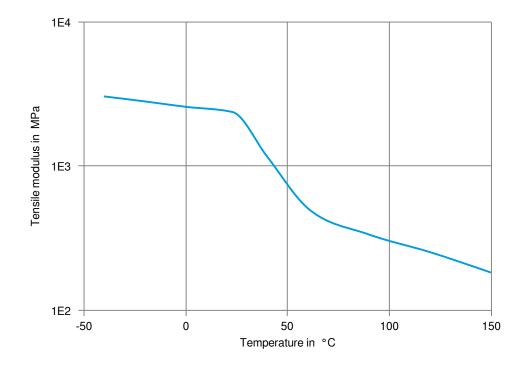


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## THERMOPLASTIC POLYESTER RESIN

Tensile modulus-temperature



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### THERMOPLASTIC POLYESTER RESIN

#### 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
- X 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
- X Chromic Acid solution (40% by mass), 23°C

#### Bases

- X 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
- ➤ 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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### THERMOPLASTIC POLYESTER RESIN

- ✓ 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
- X 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
- X 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 products 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 information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to 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 e

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