

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® SK605 NC010 is a 30% glass fiber reinforced, lubricated polybutylene terephthalate resin for injection moulding.

Product information

Resin Identification Part Marking Code	PBT-GF30 >PBT-GF30<		ISO 1043 ISO 11469
Rheological properties			
Melt volume-flow rate	7	cm ³ /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	°Č	
Melt mass-flow rate, Load	2.16	kg	
Viscosity number	100	cm ³ /g	ISO 307, 1628
Intrinsic viscosity	0.85		ISO 307, 1628
Moulding shrinkage, parallel	0.3	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.1	%	ISO 294-4, 2577
Postmoulding shrinkage, normal, 48h at 80°C	0.2	%	ISO 294-4
Postmoulding shrinkage, parallel, 48h at 80°C	0.1	%	ISO 294-4
Typical mechanical properties			
Tensile modulus	10000	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	140	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	2.7	%	ISO 527-1/-2
Flexural modulus	9000	MPa	ISO 178
Flexural strength	200	MPa	ISO 178
Tensile creep modulus, 1h	9000	MPa	ISO 899-1
Tensile creep modulus, 1000h	6600		ISO 899-1
Charpy impact strength, 23°C		kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C		kJ/m²	ISO 179/1eU
Charpy impact strength, -40°C		kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C		kJ/m ²	ISO 179/1eA
Charpy notched impact strength, -30 °C		kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40°C	10	kJ/m²	ISO 179/1eA

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Izod notched impact strength, 23°C Izod notched impact strength, -30°C Izod notched impact strength, -40°C Izod impact strength, 23°C Izod impact strength, -30°C Izod impact strength, -40°C Ball indentation hardness, H 961/30 Poisson's ratio	11 kJ/m ² 10.0 kJ/m ² 10.0 kJ/m ² 60 kJ/m ² 55 kJ/m ² 60 kJ/m ² 205 MPa 0.34	ISO 180/1A ISO 180/1A ISO 180/1A ISO 180/1U ISO 180/1U ISO 180/1U ISO 2039-1
Thermal properties		
Melting temperature, 10°C/min Glass transition temperature, 10°C/min Temperature of deflection under load, 1.8 MPa Temperature of deflection under load, 0.45 MPa Vicat softening temperature, 50°C/h 50N Ball pressure test Coefficient of linear thermal expansion (CLTE), parallel Coefficient of linear thermal expansion (CLTE), normal Thermal conductivity of melt Specific heat capacity of melt RTI, electrical, 0.75mm RTI, electrical, 3.0mm RTI, electrical, 6mm RTI, impact, 0.75mm RTI, impact, 1.5mm RTI, impact, 3.0mm RTI, impact, 3.0mm RTI, impact, 3.0mm RTI, impact, 5.0mm RTI, impact, 5.0mm RTI, impact, 0.75mm RTI, impact, 6mm RTI, strength, 0.75mm RTI, strength, 1.5mm	224 °C 55 °C 205 °C 220 °C 215 °C 210 °C 30 E-6/K 90 E-6/K 0.28 W/(m K) 1730 J/(kg K) 130 °C 130 °C	ISO 11357-1/-3 ISO 11357-1/-3 ISO 75-1/-2 ISO 75-1/-2 ISO 306 IEC 60695-10-2 ISO 11359-1/-2 ISO 11359-1/-2 ISO 22007-2 ISO 22007-4 UL 746B UL 746B UL 746B UL 746B UL 746B UL 746B UL 746B UL 746B UL 746B
RTI, strength, 3.0mm RTI, strength, 6mm	130 °C 130 °C 130 °C	UL 746B UL 746B UL 746B
	130 0	
Flammability Burning Behav. at 1.5mm nom. thickn. Thickness tested UL recognition Burning Behav. at thickness h Thickness tested UL recognition Oxygen index Glow Wire Flammability Index, 0.75mm Glow Wire Flammability Index, 1.5mm Glow Wire Flammability Index, 3.0mm Glow Wire Ignition Temperature, 0.75mm Glow Wire Ignition Temperature, 1.0mm Glow Wire Ignition Temperature, 1.5mm	HB class 1.5 mm yes HB class 0.75 mm yes 19 % 725 °C 725 °C 725 °C 750 °C 750 °C 750 °C 750 °C 750 °C 750 °C	IEC 60695-11-10 IEC 60695-11-10 UL 94 IEC 60695-11-10 IEC 60695-11-10 UL 94 ISO 4589-1/-2 IEC 60695-2-12 IEC 60695-2-12 IEC 60695-2-13 IEC 60695-2-13 IEC 60695-2-13

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	IEC 60695-2-13 IEC 60695-2-13 795 (FMVSS 302) 795 (FMVSS 302)
Electrical properties	
Relative permittivity, 100Hz3.9Relative permittivity, 1MHz3.8Dissipation factor, 100Hz7.5Dissipation factor, 10Hz7.5Volume resistivity180Surface resistivity>1E13Ohm.mSurface resistivity>1E15Electric strength38Comparative tracking index400Electric Strength, Short Time, 2mm17kV/mm	IEC 62631-2-1 IEC 62631-2-1 IEC 62631-2-1 IEC 62631-2-1 IEC 62631-3-1 IEC 62631-3-2 IEC 60243-1 IEC 60243-1 IEC 60243-1
Physical/Other properties	
Humidity absorption, 2mm0.15 %Water absorption, 2mm0.35 %Density1530 kg/m³Density of melt1360 kg/m³	Sim. to ISO 62 Sim. to ISO 62 ISO 1183
VDA Properties	
Odour3 classFogging, F-value (refraction)99 %	VDA 270 ISO 6452
Injection	
Drying RecommendedyesDrying Temperature120 °CDrying Time, Dehumidified Dryer2 - 4 hProcessing Moisture Content≤0.04 %Melt Temperature Optimum250 °CMin. melt temperature240 °CMax. melt temperature260 °CMold Temperature Optimum80 °CMin. mould temperature30 °CMax. mould temperature130 °CHold pressure range≥60 MPaHold pressure time3 s/mmBack pressureAs low as MPapossibleEjection temperatureEjection temperature180 °C	

Characteristics

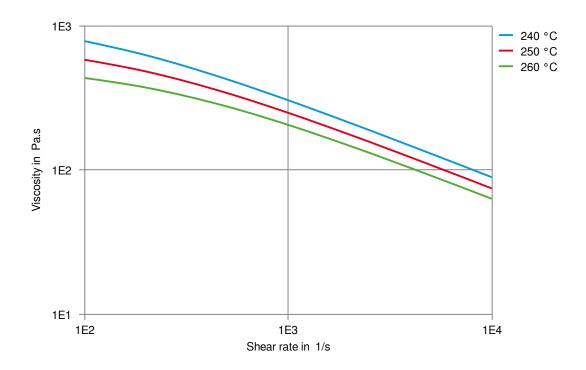
Additives

Release agent



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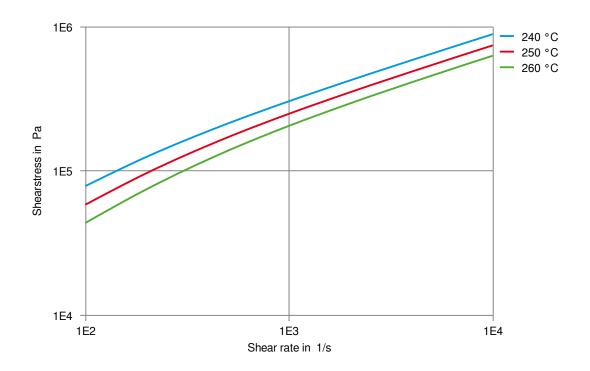
Viscosity-shear rate





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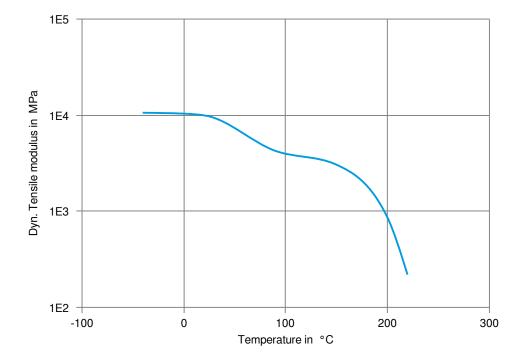
Shearstress-shear rate





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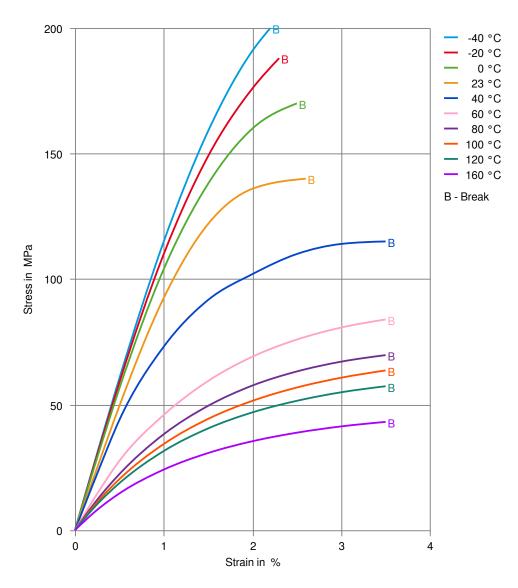
Dynamic Tensile modulus-temperature





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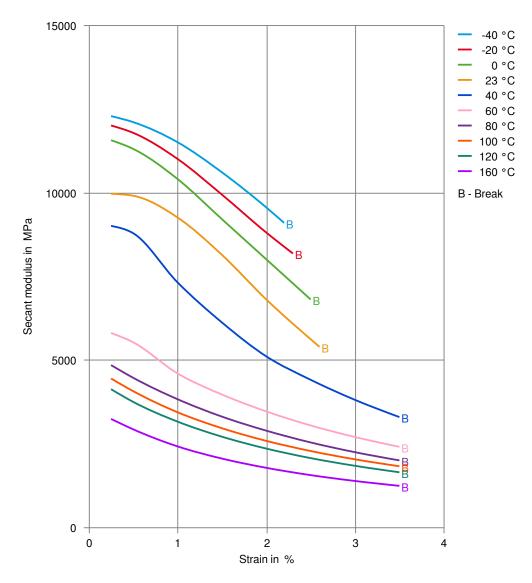
Stress-strain





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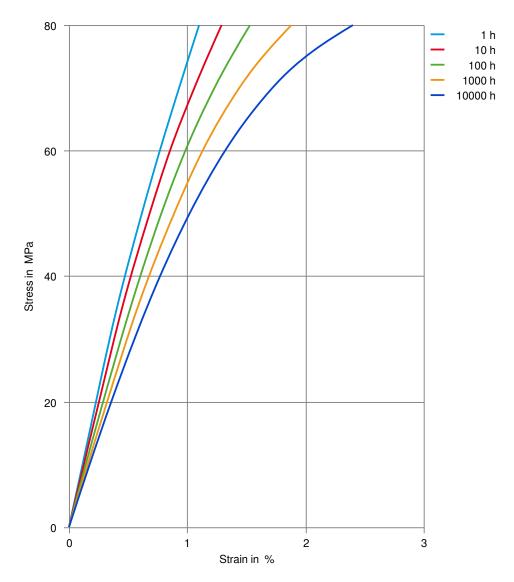
Secant modulus-strain





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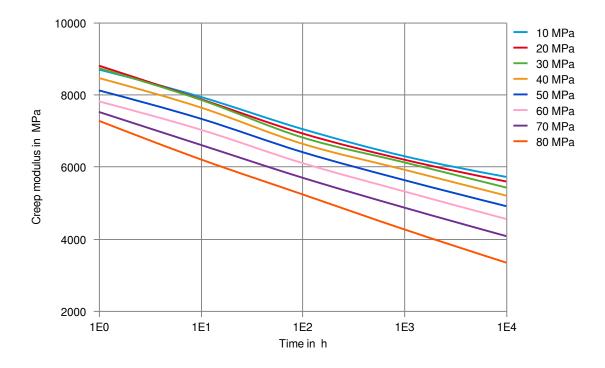
Stress-strain (isochronous) 23°C





THERMOPLASTIC POLYESTER RESIN

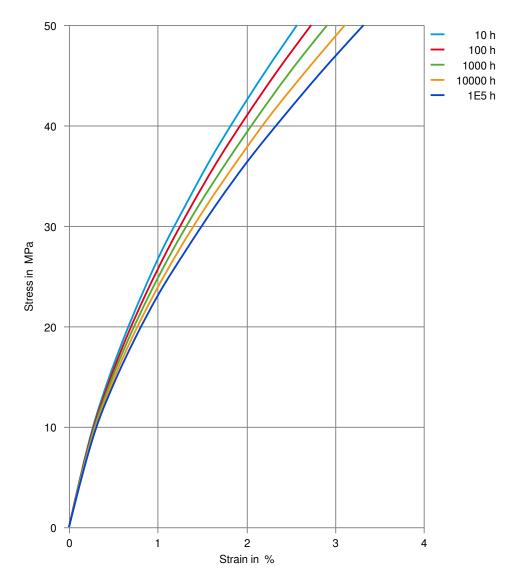
Creep modulus-time 23°C





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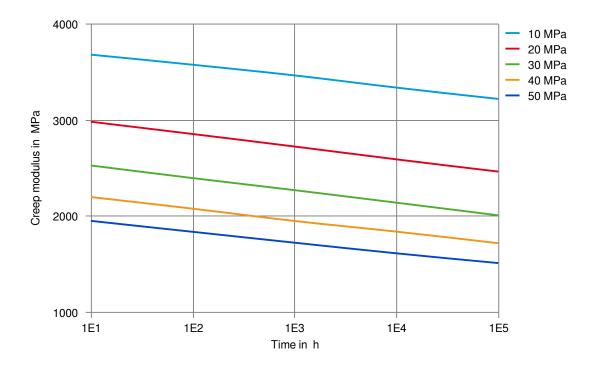
Stress-strain (isochronous) 90°C





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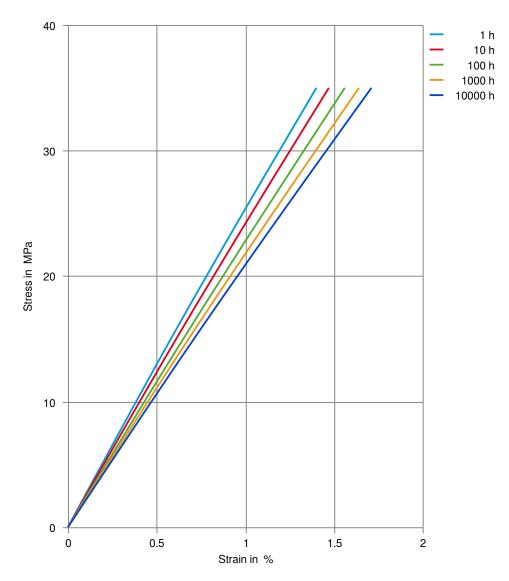
Creep modulus-time 90°C





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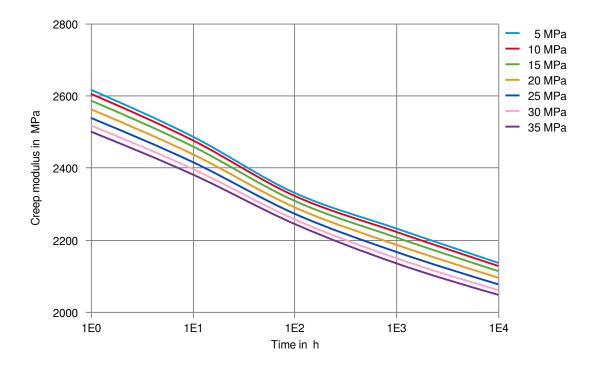
Stress-strain (isochronous) 120°C





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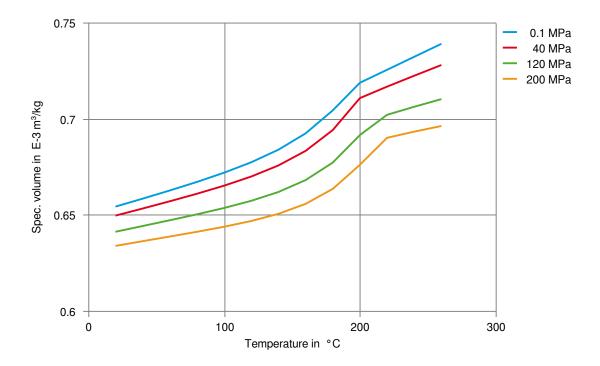
Creep modulus-time 120°C





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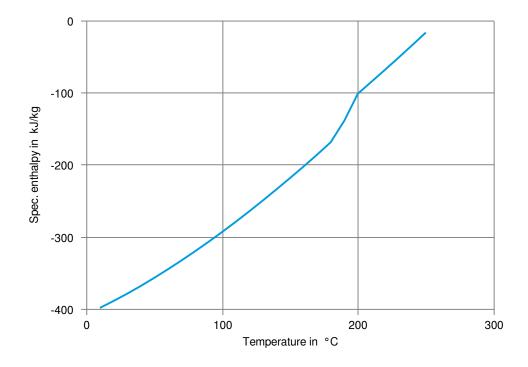
Specific volume-temperature (pvT)





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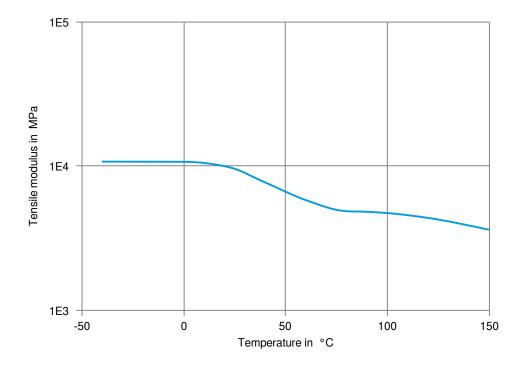
Spec. enthalpy/mass-temp. (DSC)





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Tensile modulus-temperature





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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
- X Hydrochloric Acid (36% by mass), 23°C
- X Nitric Acid (40% by mass), 23°C
- ★ 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

- ✗ 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
- X SAE 80/90 hypoid-gear oil, 130 °C
- ✓ Insulating Oil, 23°C
- X Motor oil OS206 304 Ref.Eng.Oil, ISP, 135°C
- X Automatic hypoid-gear oil Shell Donax TX, 135°C
- ★ Hydraulic oil Pentosin CHF 202, 125°C

Standard Fuels

- X ISO 1817 Liquid 1 E5, 60°C
- X ISO 1817 Liquid 2 M15E4, 60°C
- X 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
- X 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
- 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 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 information. The information contained in this publication 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 he lowest that texist. 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 seek and adhere to the manufa

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