



ZYTEL® PLUS & XT NYLON RESIN

Common features of Zytel® nylon resin include mechanical and physical properties such as high mechanical strength, excellent balance of stiffness and toughness, good high temperature performance, good electrical and flammability properties, good abrasion and chemical resistance. In addition, Zytel® nylon resins are available in different modified and reinforced grades to create a wide range of products with tailored properties for specific processes and end-uses. Zytel® nylon resin, including most flame retardant grades, offer the ability to be coloured.

The good melt stability of Zytel® nylon 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 (-31kJ/g of base polymer) in appropriately equipped installations. For disposal, local regulations have to be observed.

Zytel® nylon resin typically is used in demanding applications in the automotive, furniture, domestic appliances, sporting goods and construction industry.

Zytel® XT70G35HSL BK044A is a 35% glass fiber reinforced, heat stabilized polyamide 66 resin for injection molding. It has been developed for automotive applications requiring good retention of properties over time at temperatures up to 220°C and with good high temperature fatigue and properties.

Product information

Resin Identification Part Marking Code ISO designation	PA66-GF35 >PA66-GF35< ISO 16396-PA66	5 5,GF35,M1CGHR,S14-110	ISO 1043 ISO 11469
Rheological properties	dry/cond.		
Viscosity number	140 ^[1] /*	cm ³ /g	ISO 307, 1628
Moulding shrinkage, parallel	0.3/-	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.9/-	%	ISO 294-4, 2577
[1]: sulfuric acid 96% (130 cm³/g in formic acid 90%)			
Typical mechanical properties	dry/cond.		
Tensile modulus	11000/7500	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	200/140	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	3.2/5	%	ISO 527-1/-2
Flexural modulus	10000/7000	MPa	ISO 178
Flexural strength	260/-	MPa	ISO 178
Charpy impact strength, 23°C	90/100	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	80/-	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	13/16	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40°C	11/10	kJ/m²	ISO 179/1eA
Poisson's ratio	0.34/0.34		
Thermal properties	dry/cond.		
Melting temperature, 10°C/min	258/*	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	65/20	°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	240/*	°C	ISO 75-1/-2
Coeff. of linear therm. expansion, parallel, -40-23°C	19/*	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), parallel	19/*	E-6/K	ISO 11359-1/-2
CLTE, Parallel, 23-55°C(73-130°F)	20/-	E-6/K	ASTM E 831
Coeff. of linear therm. expansion, parallel, 55-160°C	15/*	E-6/K	ISO 11359-1/-2

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Coeff. of linear therm. expansion, normal, -40-23°C	55/*	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE),	90/*	E-6/K	ISO 11359-1/-2
normal			
Coeff. of linear therm. expansion, normal, 55-160°C	150/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, Normal,23-55°C	70/-	E-6/K	ASTM E 831
(73-130°F)			
Thermal conductivity of melt	0.25	W/(m K)	ISO 22007-2
Specific heat capacity of melt	2050	J/(kg K)	ISO 22007-4

Flammability

FMVSS Class	В	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	33 mm/min	ISO 3795 (FMVSS 302)

Electrical properties

Electric strength	35/16	kV/mm	IEC 60243-1
Licetile Strength	00710	17 4 / 11 11 11	120 00240 1

dry/cond.

dry/cond.

Physical/Other properties

Humidity absorption, 2mm	2.1/*	%	Sim. to ISO 62
Density	1410/-	kg/m³	ISO 1183
Density of melt	1240	kg/m³	

VDA Properties

Coeff. of linear therm. expansion -40°C to +100°C,	19 E-6/K	ISO 11359-1/-2
parallel		
Coeff. of linear therm. expansion -40°C to +100°C,	90 E-6/K	ISO 11359-1/-2

Injection

yes
80 °C
2-4 h
≤0.2 %
290 °C
280 °C
300 °C
95 °C
70 °C
120 °C
211 °C

Characteristics

Processing Injection Moulding

Delivery form Pellets

Additives Release agent

Special characteristics Heat stabilised or stable to heat

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CPN5077;01994_15_00257

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Automotive

OEM STANDARD ADDITIONAL INFORMATION
BMW GS93016-PA66-GF35 (Highly Heat Aging Resistant)

General Motors GMW17961P-PA-GF35-T2 Black

Hyundai MS211-72 Type B
Hyundai MS211-72 Type B

Mercedes-Benz DBL5408.50 PA66 GF35

Renault-Nissan AS23-b, No Spec, Special Part Approval, See

Your CE Account Manager.

Renault-Nissan AS24, No Spec, Special Part Approval, See

Your CE Account Manager.

Renault-Nissan AS24-a, No Spec, Special Part Approval, See

Your CE Account Manager.

Renault-Nissan UB02a, No Spec, Special Part Approval, See

Your CE Account Manager.

Renault-Nissan UB02d, No Spec, Special Part Approval, See

Your CE Account Manager.

Stellantis B62 0300 / 61/219M-/221E/11/H114/H412 +

Stellantis - Chrysler \$620001 \(\frac{1}{7} \) CPN-5077 Black

VW Group VW 50133 PA66-7-A Valeo PDTNVC15006 RevE

 Valeo
 PDTNVC15006 RevE
 PA66-GF35 Class 5A

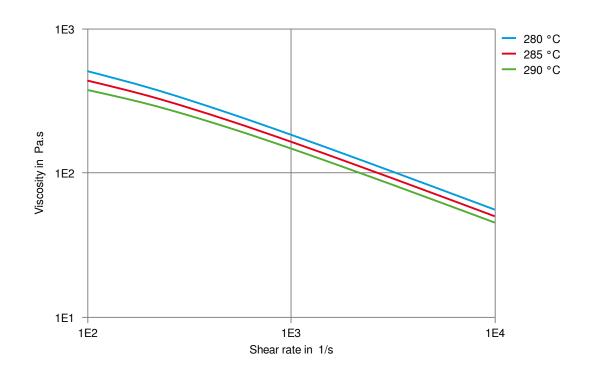
 Valeo
 PDTNVC15006 RevE
 PA66-GF35 Class 6

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Viscosity-shear rate

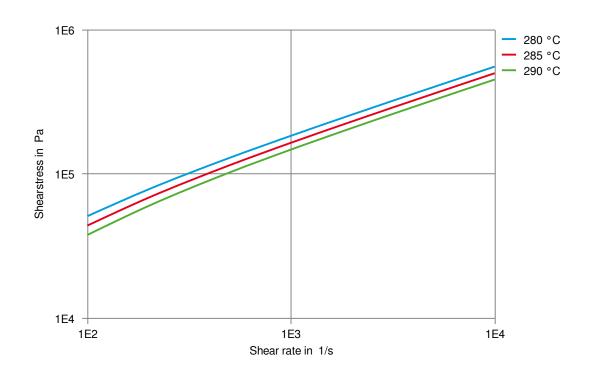


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Shearstress-shear rate

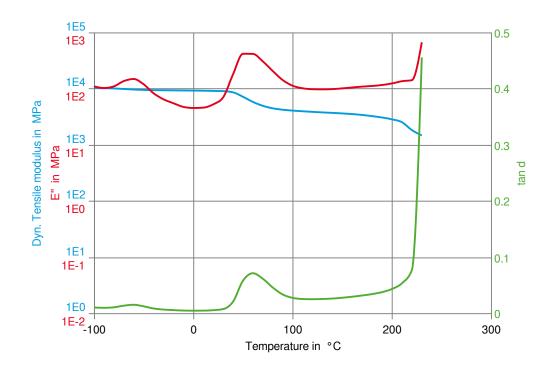


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Dynamic Tensile modulus-temperature (dry)



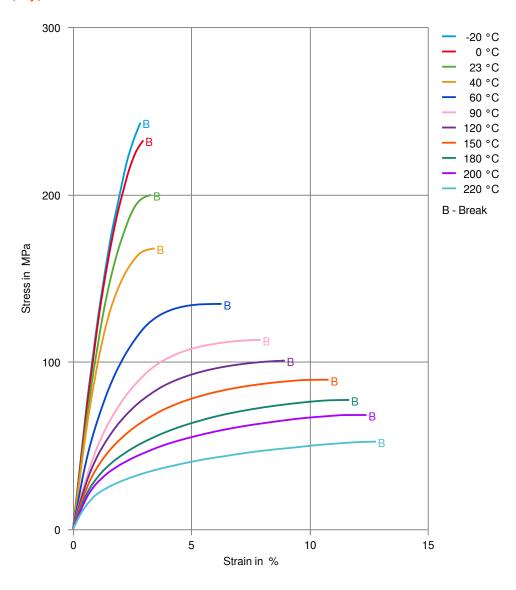
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Stress-strain (dry)



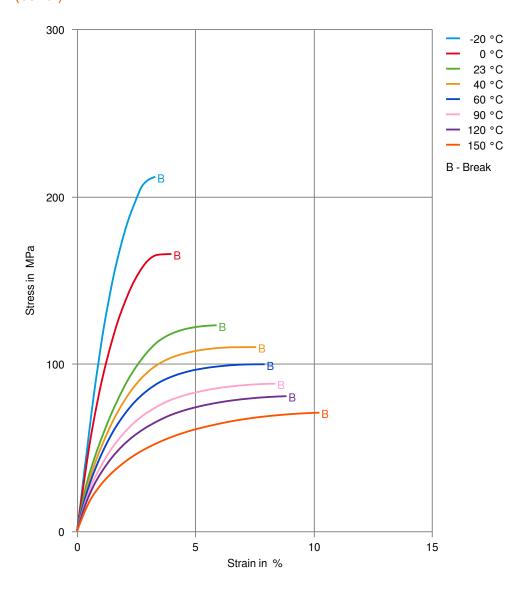
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ZYTEL® PLUS & XT NYLON RESIN

Stress-strain (cond.)



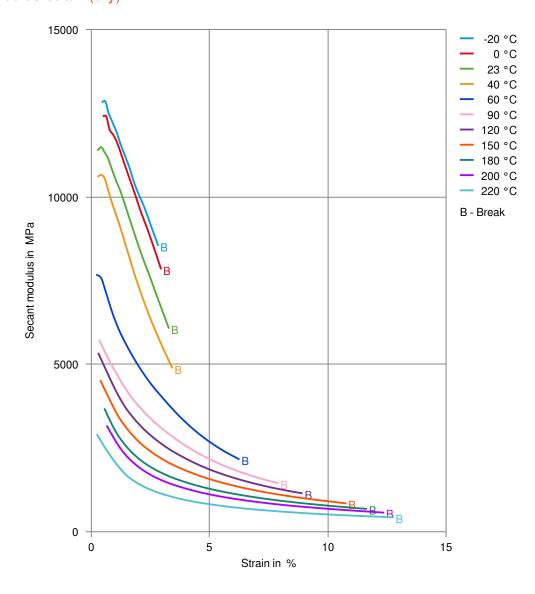
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ZYTEL® PLUS & XT NYLON RESIN

Secant modulus-strain (dry)



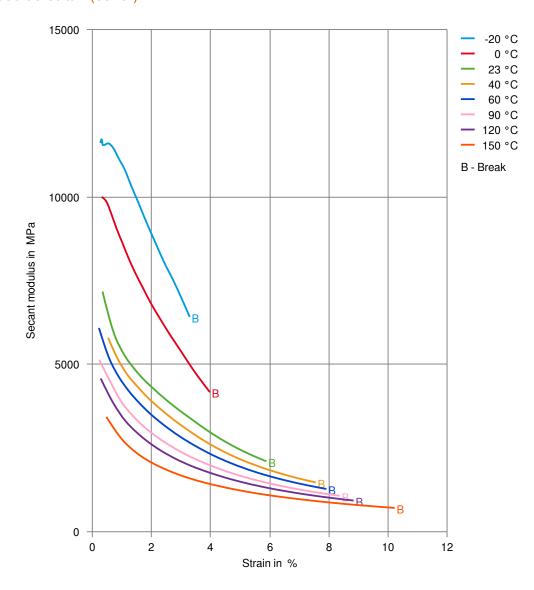
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ZYTEL® PLUS & XT NYLON RESIN

Secant modulus-strain (cond.)



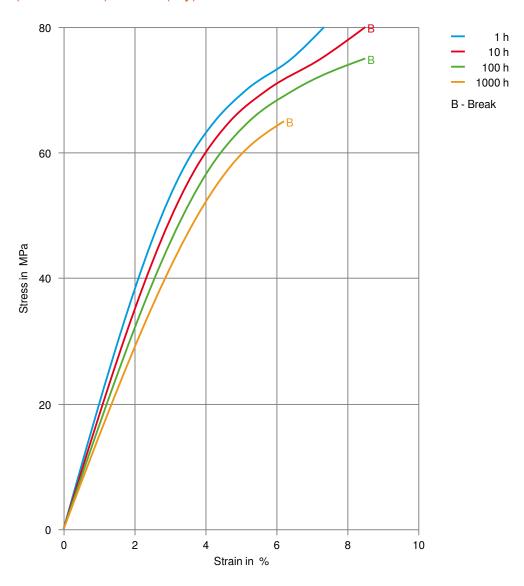
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Stress-strain (isochronous) 160°C (dry)

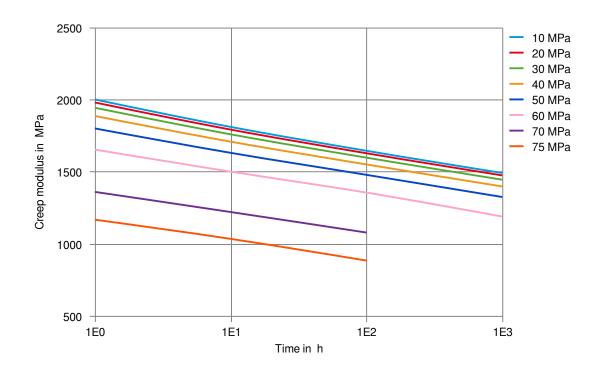


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Creep modulus-time 160°C (dry)



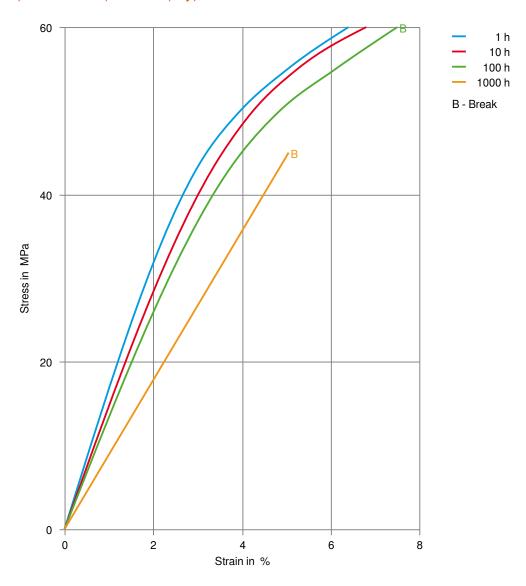
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Zytel® XT70G35HSL BK044A ZYTEL® PLUS & XT NYLON RESIN

Stress-strain (isochronous) 190°C (dry)

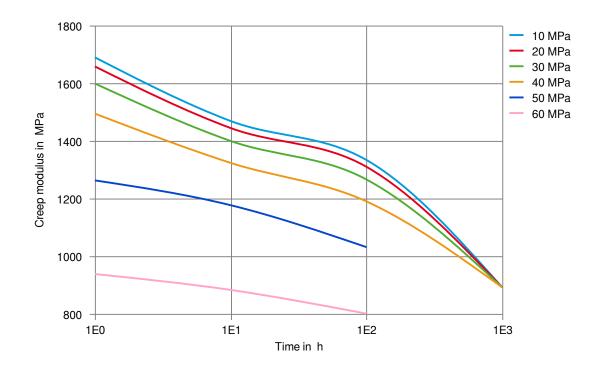


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Creep modulus-time 190°C (dry)

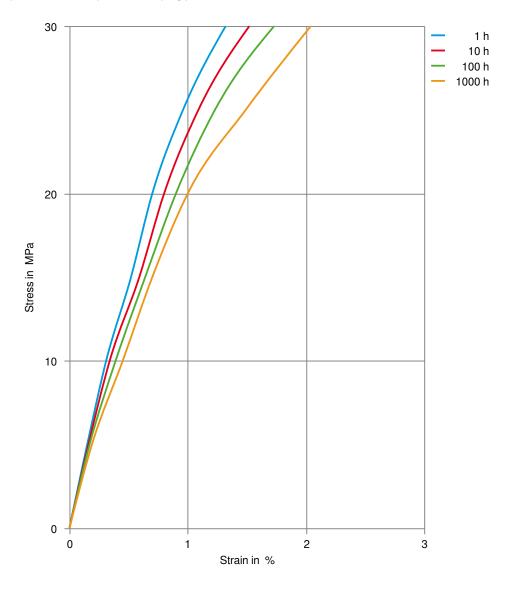


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Stress-strain (isochronous) 200°C (dry)

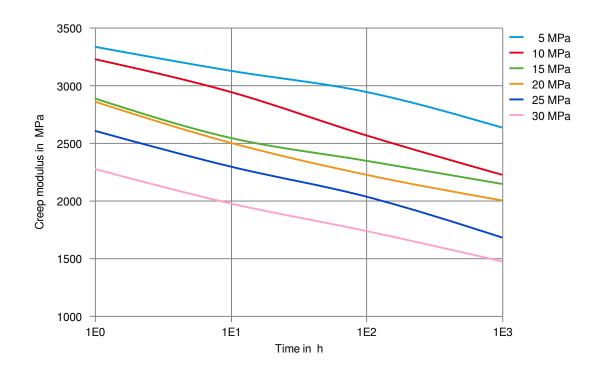


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Creep modulus-time 200°C (dry)



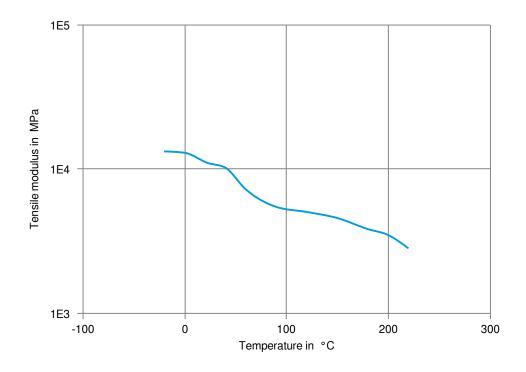
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Zytel® XT70G35HSL BK044A ZYTEL® PLUS & XT NYLON RESIN

Tensile modulus-temperature (dry)



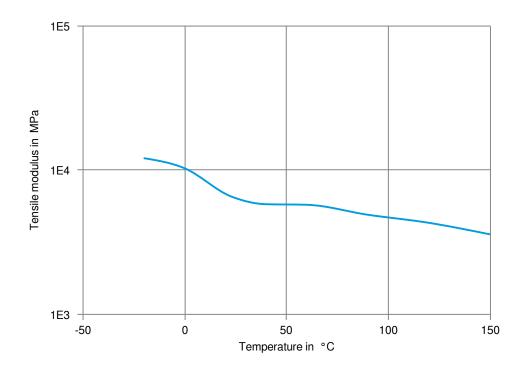
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Zytel® XT70G35HSL BK044A ZYTEL® PLUS & XT NYLON RESIN

Tensile modulus-temperature (cond.)

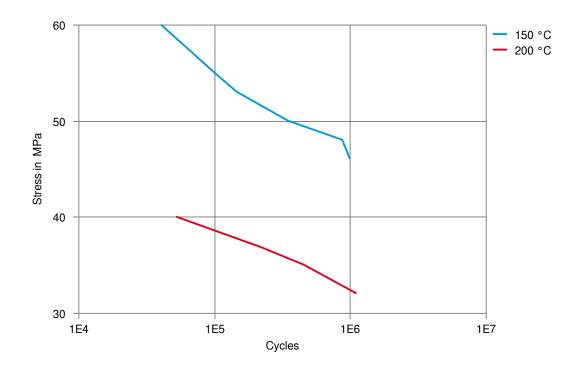


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Tensile Fatigue, 10Hz, R=0.1 @ 2mm (dry)



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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
- 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
- ✓ SAE 10W40 multigrade motor oil, 130°C
- ✓ SAE 80/90 hypoid-gear oil, 130°C
- ✓ Insulating Oil, 23°C
- ✓ Motor oil OS206 304 Ref.Eng.Oil, ISP, 135°C
- ✓ Automatic hypoid-gear oil Shell Donax TX, 135°C
- ✓ Hydraulic oil Pentosin CHF 202, 125°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
- X Zinc Chloride solution (50% by mass), 23°C

Other

- ✓ Ethyl Acetate, 23°C
- X 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
- X Water, 90°C
- X Phenol solution (5% by mass), 23°C
- ★ Coolant Glysantin G48, 1:1 in water, 125°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 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 equipment, pr

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