Zytel® FR50 BK505

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® FR50 BK505 is a 25% glass fiber reinforced, flame retardant polyamide 66 resin for injection molding.

Product information

Resin Identification	PA66-GF25 FR(17)	ISO 1043
Part Marking Code	>PA66-GF25 FR(17)<	ISO 11469
ISO designation	ISO 16396-PA66,GF25 FR(17),M1CF1GR,S14-110	
Infrared spectrum	available	

Rheological properties

	dry/cond.		
Viscosity number	4150[1]/*[DS]	in³/lb	ISO 307, 1628
Molding shrinkage, parallel	0.3 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	0.7 / -	%	ISO 294-4, 2577

[DS]: Derived from similar grade

[1]: Sulfuric acid 96%

Typical mechanical properties

	dry/cond.		
Tensile modulus	1.6E6 / 1.16E6	psi	ISO 527-1/-2
Tensile stress at break, 5mm/min	23200 / 17400	psi	ISO 527-1/-2
Tensile strain at break, 5mm/min	2.1 / 3	%	ISO 527-1/-2
Flexural modulus	1.38E6 / 1.09E6	psi	ISO 178
Charpy impact strength, 23 °C	30.9 / -	ftlb/in²	ISO 179/1eU
Charpy impact strength, -30 °C	28.5 / -	ftlb/in²	ISO 179/1eU
Charpy impact strength, -40 °C	23.8 / -[DS]	ftlb/in²	ISO 179/1eU
Charpy notched impact strength, 23 °C	4.76 / 5.71	ftlb/in²	ISO 179/1eA
Charpy notched impact strength, -30 °C	4.28 / 5.23	ftlb/in²	ISO 179/1eA
Charpy notched impact strength, -40 °C	4.28 / 4.76	ftlb/in²	ISO 179/1eA

[DS]: Derived from similar grade

Thermal properties

	dry/cond.		
Melting temperature, 10 °C/min	500[2]/*	°F	ISO 11357-1/-3
Glass transition temperature, 10 °C/min	176 / 68	°F	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	468 / *	°F	ISO 75-1/-2
Coefficient of linear thermal expansion (CLTE), parallel	0.12 / *	E-4/°F	ISO 11359-1/-2

Zytel® FR50 BK505

NYLON RESIN

Coefficient of linear thermal expansion (CLTE), parallel, -40-23°C	0.139 / *	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), parallel, 55-160°C	0.0667 / *	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	0.439 / *	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal, -40-23°C	0.383 / *	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal, 55-160°C	0.611 / *	E-4/°F	ISO 11359-1/-2
Thermal conductivity of melt	0.25	W/(m K)	ISO 22007-2
Specific heat capacity of melt	2000	J/(kg K)	ISO 22007-4
RTI, electrical, 0.75mm	266	°F	UL 746B
RTI, electrical, 1.5mm	266	°F	UL 746B
RTI, electrical, 3.0mm	266	°F	UL 746B
RTI, impact, 0.75mm	221	°F	UL 746B
RTI, impact, 1.5mm	239	°F	UL 746B
RTI, impact, 3.0mm	239	°F	UL 746B
RTI, strength, 0.75mm	221	°F	UL 746B
RTI, strength, 1.5mm	239 / *	°F	UL 746B
RTI, strength, 3.0mm	248	°F	UL 746B

[2]: 1st heating

Flammability

	dry/cond.		
Burning Behav. at 1.5mm nom. thickn.	V-0 / *	class	IEC 60695-11-10
Thickness tested	0.0591 / *	in	IEC 60695-11-10
UL recognition	yes / *		UL 94
Burning Behav. at thickness h	V-0 / *	class	IEC 60695-11-10
Thickness tested	0.0138 / *	in	IEC 60695-11-10
UL recognition	yes / *		UL 94
Burning Behav. 5V at thickness h	5VA / *	class	IEC 60695-11-20
Thickness tested	0.0591 / *	in	IEC 60695-11-20
UL recognition	yes / *		UL 94
Oxygen index	35 / *	%	ISO 4589-1/-2
Glow Wire Flammability Index, 0.75mm	1760 / -	°F	IEC 60695-2-12
Glow Wire Flammability Index, 1.5mm	1760 / -	°F	IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	1760 / -	°F	IEC 60695-2-12
Glow Wire Ignition Temperature, 0.75mm	1650 / -	°F	IEC 60695-2-13
Glow Wire Ignition Temperature, 1.5mm	1650 / -	°F	IEC 60695-2-13
Glow Wire Ignition Temperature, 3.0mm	1710 / -	°F	IEC 60695-2-13
FMVSS Class	SE / B		ISO 3795 (FMVSS 302)

Electrical properties

	dry/cond.		
Volume resistivity	>1E13 / 2.7 E10[DS]	Ohm.m	IEC 62631-3-1
Comparative tracking index	275 / -[DS]		IEC 60112
Electric Strength, Short Time, 1mm	762 / -	V/mil	IEC 60243-1
Electric Strength, Short Time, 2mm	610 / 559[DS]	V/mil	IEC 60243-1

Zytel® FR50 BK505

NYLON RESIN

[DS]: Derived from similar grade

Physical/Other properties

	dry/cond.		
Humidity absorption, 2mm	1.3 / *	%	Sim. to ISO 62
Water absorption, 2mm	3.4 / *[DS]	%	Sim. to ISO 62
Water absorption, Immersion 24h	0.6[3]/*	%	Sim. to ISO 62
Density	0.0578 / -	lb/in³	ISO 1183

[DS]: Derived from similar grade

[3]: thickness,2mm

Emissions

Emission of organic compounds	4.7	µgC/g	VDA 277
Odor test	4.5	class	VDA 270

Injection

Drying Recommended	yes	
Drying Temperature	176	°F
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.2	%
Melt Temperature Optimum	554	°F
Min. melt temperature	536	°F
Max. melt temperature	572	°F
Max. screw tangential speed	≤0.2	m/s
Mold Temperature Optimum	212	°F
Min. mold temperature	158	°F
Max. mold temperature	248	°F
Hold pressure range	7250 - 14500	psi
Hold pressure time	0.0762	s/mil
Hold Pressure Time (h is the max. wall thickness of the part in mm)	h²+2	s
Ejection temperature	410	°F

Automotive

OEM	STANDARD	ADDITIONAL INFORMATION
CATL	MCR0000561	
General Motors	GMW17481P-PA66-GF25	Black
Hyundai	MS941-03 Type A-5 FRV0	
Stellantis	B62 0300 / 61/223E-216M/C1/C4	01378_19_02645

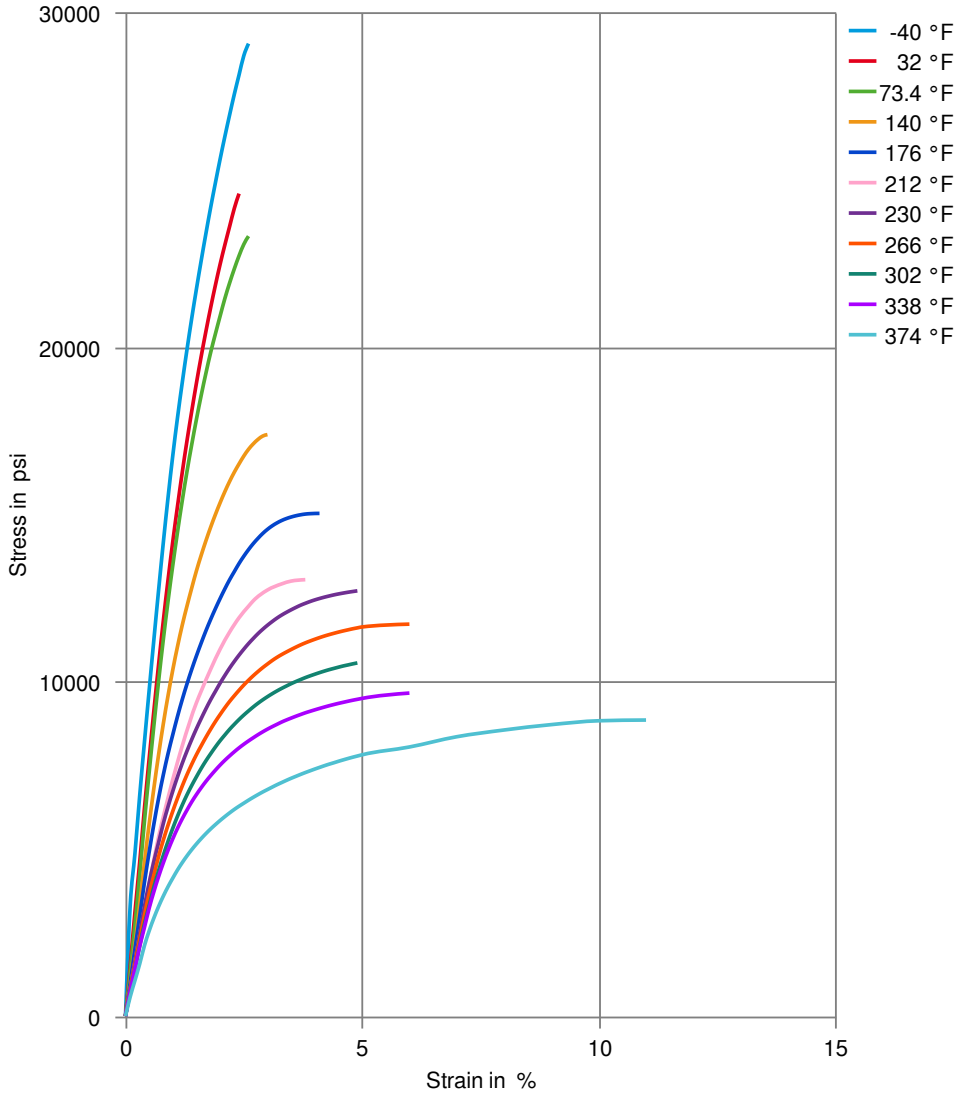
Characteristics

Processing	Injection Molding
Additives	Flame retardant
Special characteristics	Flame retardant

Zytel® FR50 BK505

NYLON RESIN

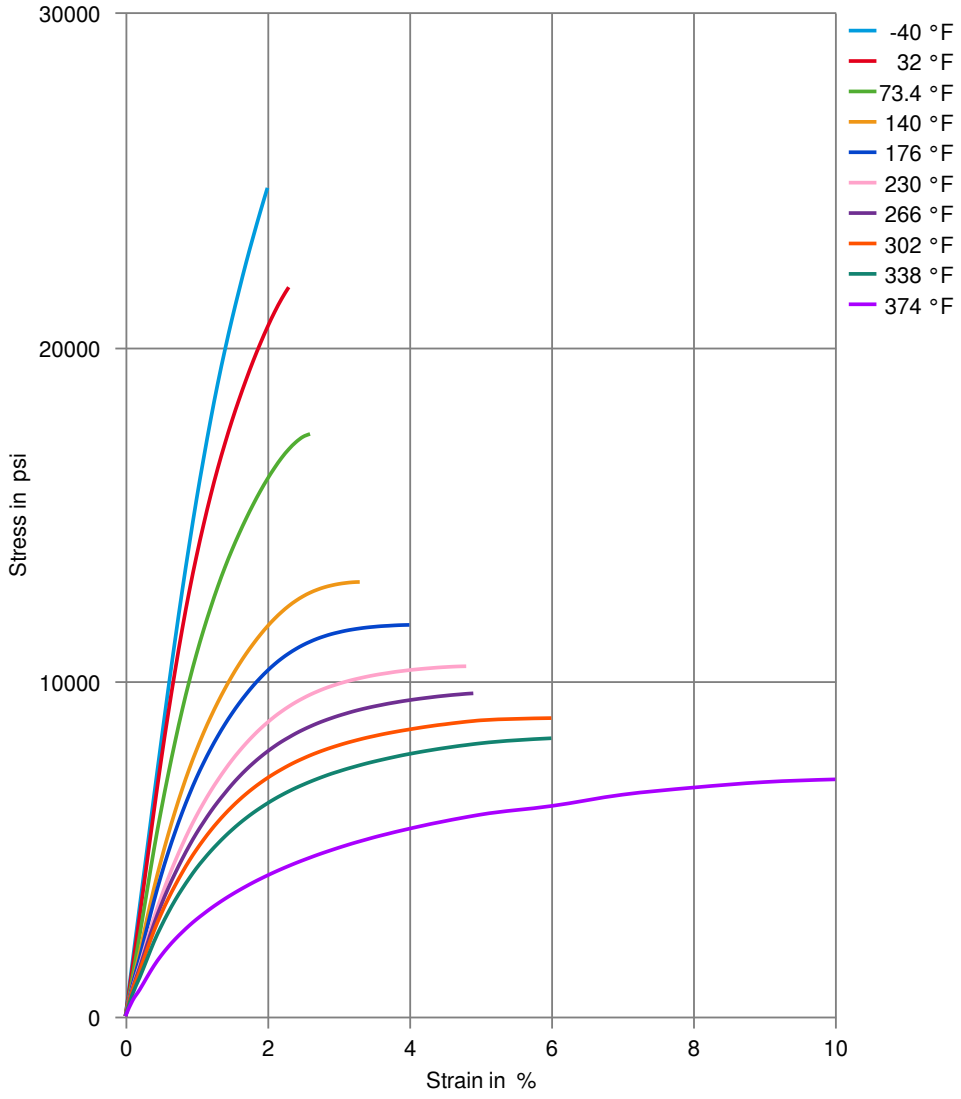
Stress-strain (dry)



Zytel® FR50 BK505

NYLON RESIN

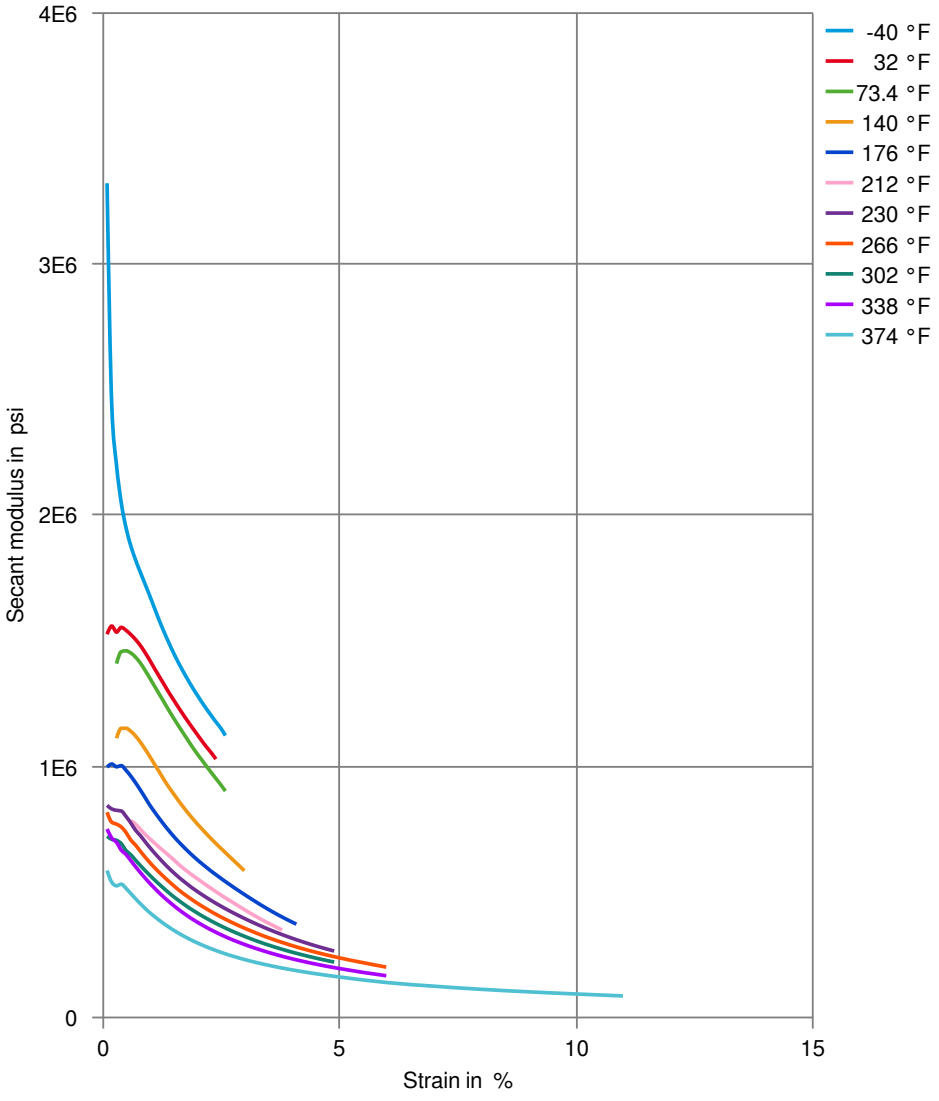
Stress-strain (cond.)



Zytel® FR50 BK505

NYLON RESIN

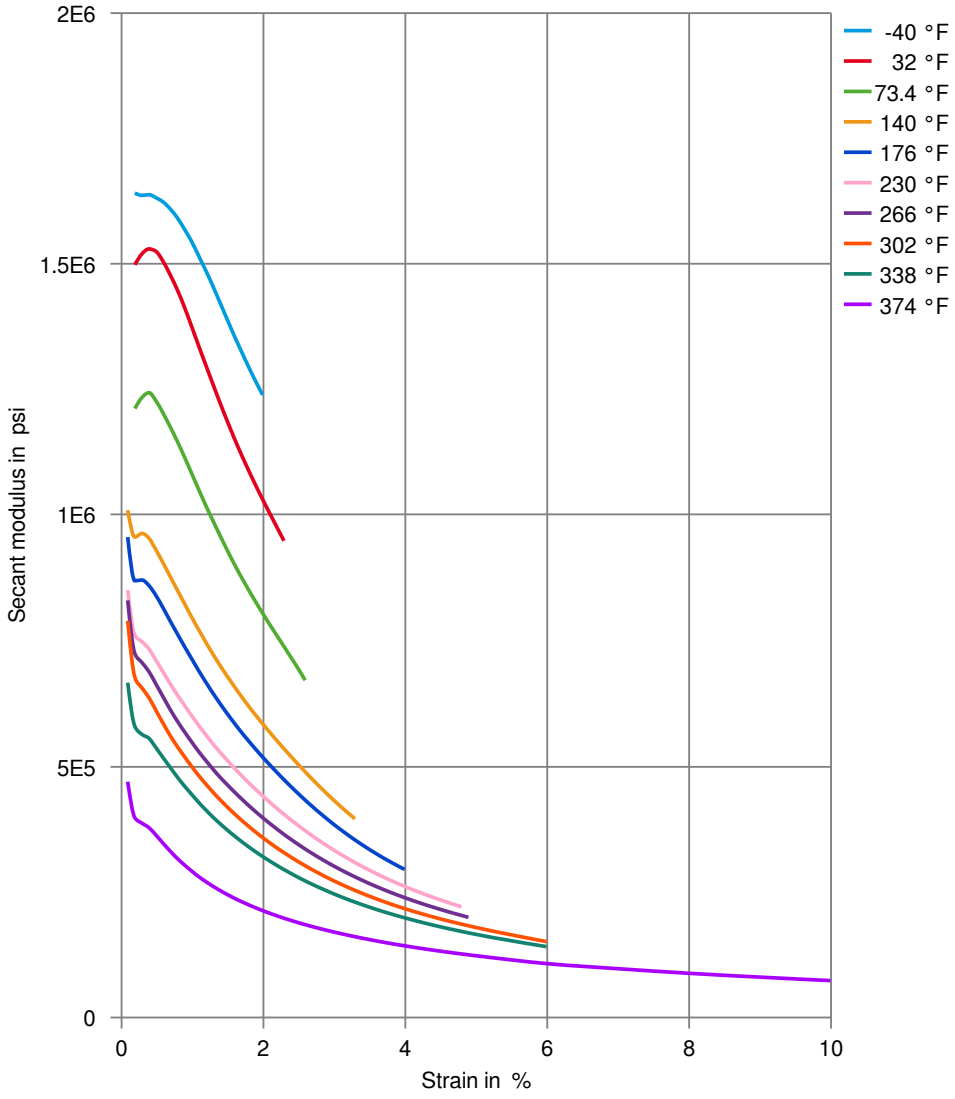
Secant modulus-strain (dry)



Zytel® FR50 BK505

NYLON RESIN

Secant modulus-strain (cond.)



Zytel® FR50 BK505

NYLON 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
- ✘ 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

Salt solutions

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

Zytel® FR50 BK505

NYLON 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
- ✘ 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).

Revised: 2025-07-08 Source: Celanese Materials Database

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. Colorants or other additives may cause significant variations in data values. Properties of molded 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 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 manufacturer's current instructions for handling each material they use, and entrust the handling of such material to adequately trained personnel only. Please call the telephone numbers listed for additional technical information. Call Customer Services for the appropriate Materials Safety Data Sheets (MSDS) before attempting to process our products.
Copyright © 2026 Celanese or its affiliates. All rights reserved.
Celanese®, registered C-ball design and all other trademarks identified herein with ®, TM, SM, unless otherwise noted, are trademarks of Celanese or its affiliates.