(+) 18816996168 Ponciplastics.com



## Minlon® EFE6053 BK413

#### MINERAL REINFORCED NYLON RESIN

Common features of Minlon® nylon resin include mechanical and physical properties such as high mechanical strength, excellent balance of stiffness /toughness, good high temperature performance, good chemical resistance, paintability, dimensional stability and low warpage.

Grades with improved electrical and flammability properties are available within the Zytel® nylon resin product line. In addition, Minlon® nylon resin is available in different modified and reinforced grades to create a wide range of products with tailored properties for specific processes and enduses

The good melt stability of Minlon® 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.

Minlon® nylon resin typically is used in demanding applications in the automotive, electrical, electronic, domestic appliances and construction industries.

Minlon® EFE6053 BK413 is a 40% mineral/glass reinforced, heat stabilised polyamide 66 resin for injection moulding.

#### **Product information**

1 reddet mermanen			
Resin Identification	PA66-(GF+MD)		ISO 1043
	40	)	
Part Marking Code	>PA66-(GF+MD	)40<	ISO 11469
ISO designation	ISO 16396-PA66	6,(MD+GF)40,N	M1CGHR,S14-100
Rheological properties	dry/cond.		
Viscosity number	143/*	cm <sup>3</sup> /g	ISO 307, 1628
Moulding shrinkage, parallel	0.4/-	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.1/-	%	ISO 294-4, 2577
Typical mechanical properties	dry/cond.		
Tensile modulus	10000/6500	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	160/97	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	2.2/4.6	%	ISO 527-1/-2
Flexural modulus	9500/-	MPa	ISO 178
Flexural strength	210/-	MPa	ISO 178
Tensile creep modulus, 1h	*/6000	MPa	ISO 899-1
Tensile creep modulus, 1000h	*/3700	MPa	ISO 899-1
Charpy impact strength, 23°C	45/50	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	40/40	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	4.5/6.5	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	4/6	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C	4/5	kJ/m²	ISO 180/1A
Izod notched impact strength, -30°C	4.0/4.5	kJ/m²	ISO 180/1A
Poisson's ratio	0.34/0.35		
Thermal properties	dry/cond.		
Melting temperature, 10°C/min	262/*	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	70/-	°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	240/*	°C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	256/*	°C	ISO 75-1/-2

Printed: 2025-05-29 Page: 1 of 20





## MINERAL REINFORCED NYLON RESIN

Vicat softening temperature, 50°C/h 50N	250/*	°C	ISO 306
Coeff. of linear therm. expansion, parallel, -40-23°C	22/*	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion	28/*	E-6/K	ISO 11359-1/-2
(CLTE), parallel			
Coeff. of linear therm. expansion, parallel, 55-160°C	31/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, -40-23°C	46/*	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE),	87/*	E-6/K	ISO 11359-1/-2
normal			
Coeff. of linear therm. expansion, normal, 55-160°C	127/*	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.27	W/(m K)	ISO 22007-2
Specific heat capacity of melt	1900	J/(kg K)	ISO 22007-4
Flammability			
FMVSS Class		В	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm		28 mm/min	ISO 3795 (FMVSS 302)
Burning rate, Trickness I min		20 11111/111111	130 3793 (FIMV33 302)
Electrical properties	dry/cond.		
Deletive represidivite 4001 le	40/100		IEC 60601 0 1

Electrical	properties

### Physical/Other properties

Humidity absorption, 2mm	1.5/*	%	Sim. to ISO 62
Water absorption, 2mm	5/*	%	Sim. to ISO 62
Density	1470/-	kg/m³	ISO 1183
Density of melt	1250	kg/m³	

dry/cond.

### Injection

Drying Recommended	yes	
Drying Temperature	80	°C
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.2	%
Melt Temperature Optimum	292	°C
Min. melt temperature	280	°C
Max. melt temperature	305	°C
Screw tangential speed	≤0.15	m/s
Mold Temperature Optimum	105	°C
Min. mould temperature	90	°C
Max. mould temperature	120	°C
Hold pressure range	50 - 100	MPa
Hold pressure time	3	s/mm
Ejection temperature	225	°C

Printed: 2025-05-29 Page: 2 of 20





#### MINERAL REINFORCED NYLON RESIN

#### Characteristics

Processing Injection Moulding

Delivery form Pellets

Additives Release agent

Special characteristics Heat stabilised or stable to heat

#### **Automotive**

OEM STANDARD ADDITIONAL INFORMATION
BMW GS93016-PA66-(GF25+MX15) (High Heat Aging Resistant)

Ford WSS-M4D823-B1

General Motors GMW8751P-PA66-M15GF25 Black

Mercedes-Benz DBL5409.40 PA66-(GF+MD)40

 Stellantis
 MS.50017 / PA66.GM40.7200F.30C.HS
 CPN2554

 Stellantis - Chrysler
 MS.50017 / CPN-2554
 Black

VW Group VW 50127 PA66-13

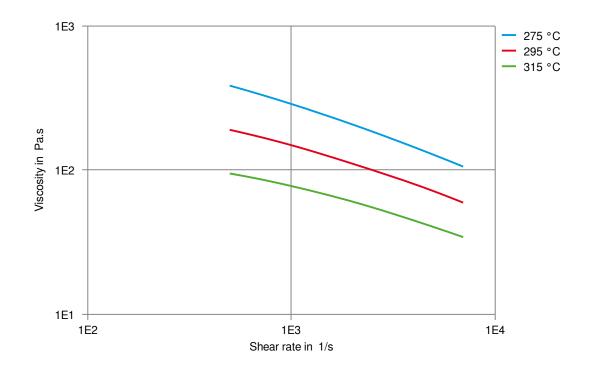
Printed: 2025-05-29 Page: 3 of 20





## MINERAL REINFORCED NYLON RESIN

Viscosity-shear rate



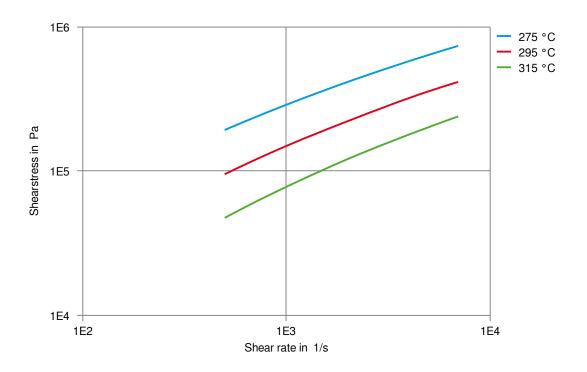
Printed: 2025-05-29 Page: 4 of 20





### MINERAL REINFORCED NYLON RESIN

Shearstress-shear rate



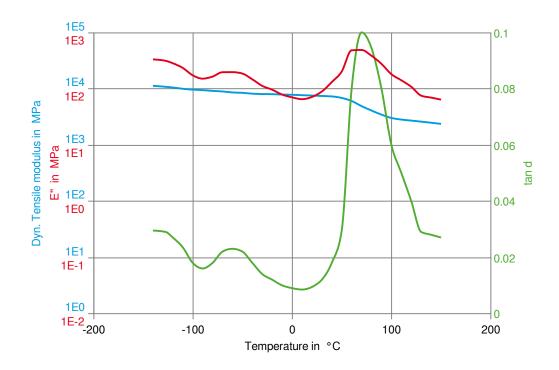
Printed: 2025-05-29 Page: 5 of 20





### MINERAL REINFORCED NYLON RESIN

Dynamic Tensile modulus-temperature (dry)



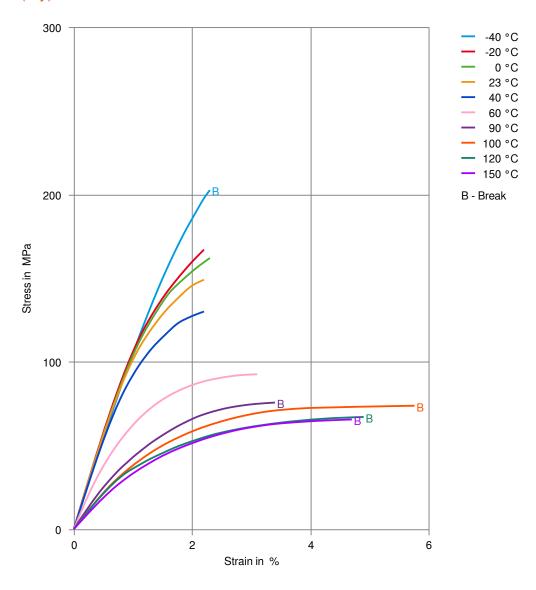
Printed: 2025-05-29 Page: 6 of 20





### MINERAL REINFORCED NYLON RESIN

Stress-strain (dry)



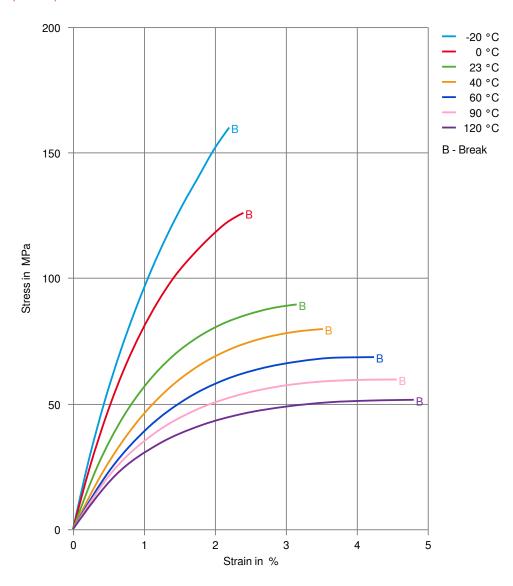
Printed: 2025-05-29 Page: 7 of 20





## MINERAL REINFORCED NYLON RESIN

Stress-strain (cond.)



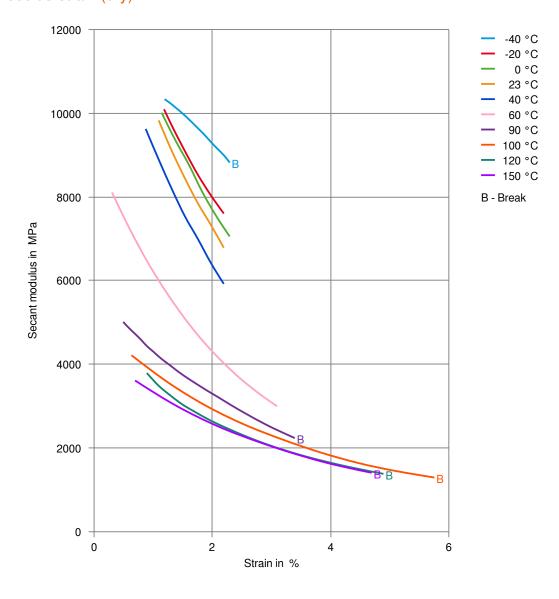
Printed: 2025-05-29 Page: 8 of 20





## MINERAL REINFORCED NYLON RESIN

Secant modulus-strain (dry)



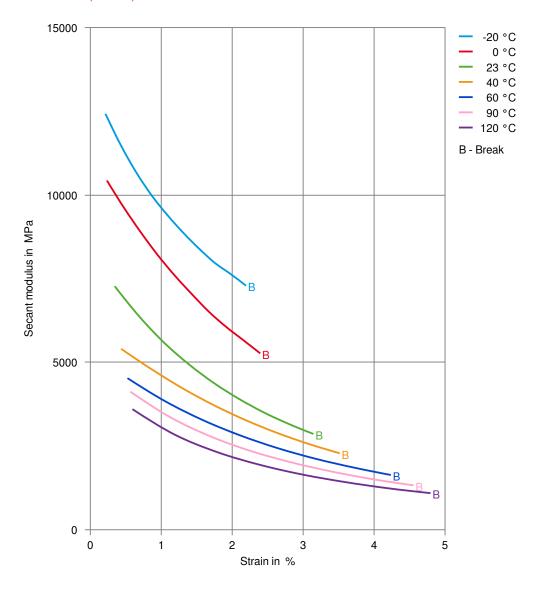
Printed: 2025-05-29 Page: 9 of 20





## MINERAL REINFORCED NYLON RESIN

Secant modulus-strain (cond.)



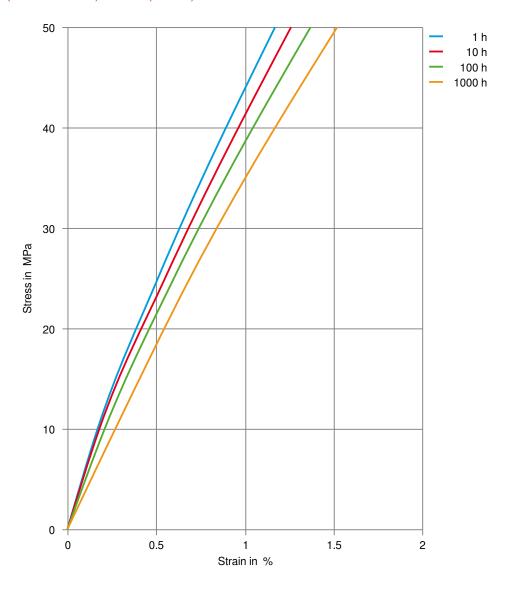
Printed: 2025-05-29 Page: 10 of 20





### MINERAL REINFORCED NYLON RESIN

Stress-strain (isochronous) 23°C (cond.)



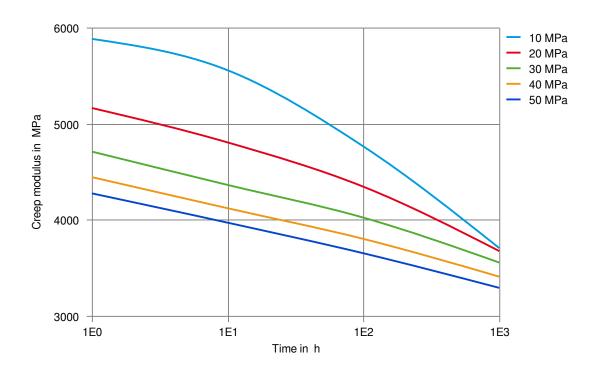
Printed: 2025-05-29 Page: 11 of 20





## MINERAL REINFORCED NYLON RESIN

Creep modulus-time 23°C (cond.)



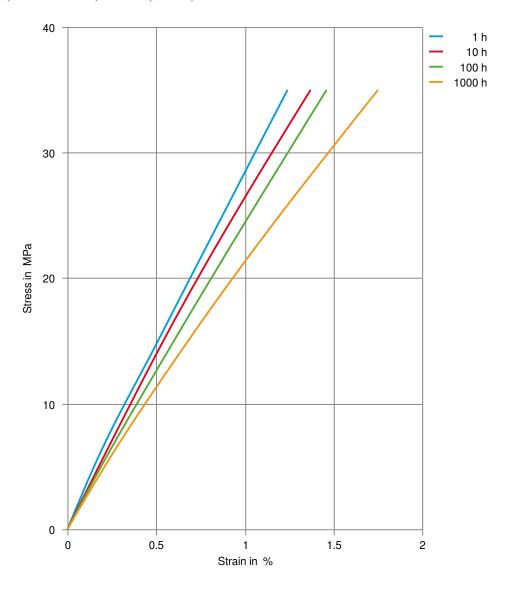
Printed: 2025-05-29 Page: 12 of 20





## MINERAL REINFORCED NYLON RESIN

Stress-strain (isochronous) 60°C (cond.)



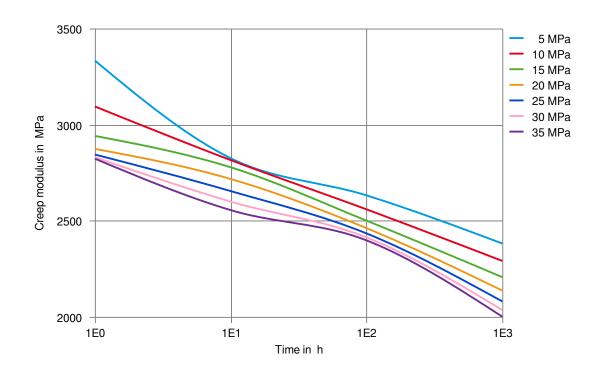
Printed: 2025-05-29 Page: 13 of 20





## MINERAL REINFORCED NYLON RESIN

Creep modulus-time 60°C (cond.)



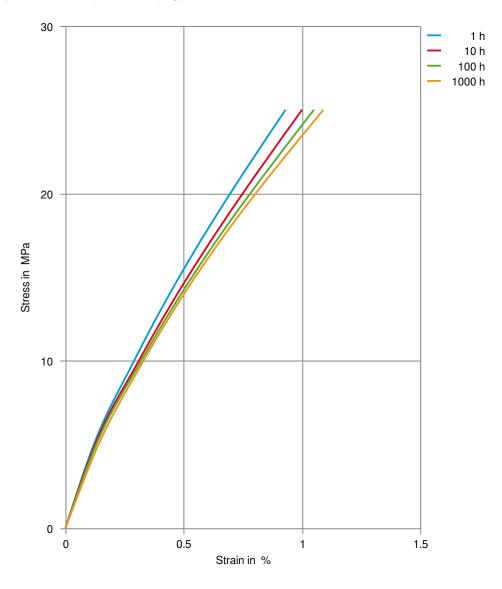
Printed: 2025-05-29 Page: 14 of 20





## MINERAL REINFORCED NYLON RESIN

Stress-strain (isochronous) 120°C (dry)



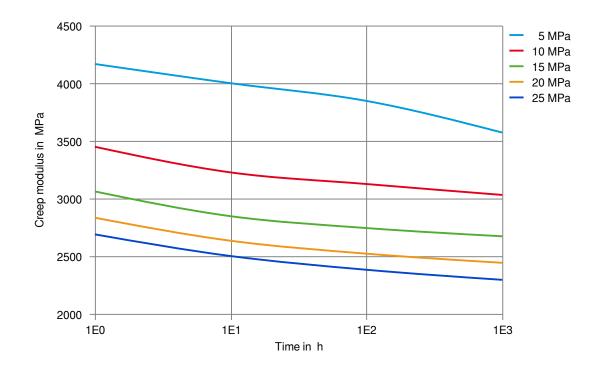
Printed: 2025-05-29 Page: 15 of 20





### MINERAL REINFORCED NYLON RESIN

Creep modulus-time 120°C (dry)



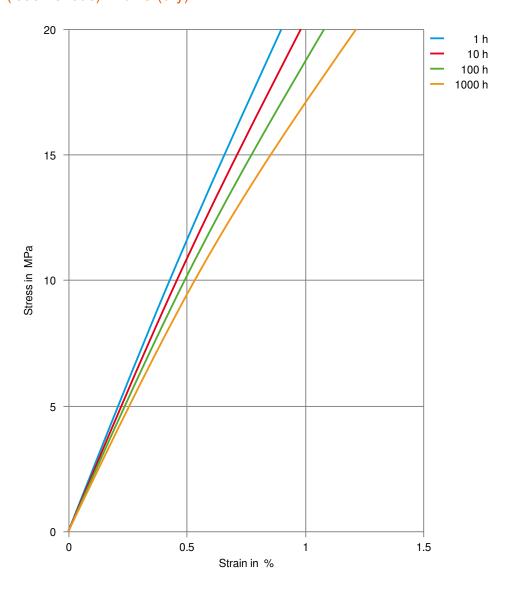
Printed: 2025-05-29 Page: 16 of 20





## MINERAL REINFORCED NYLON RESIN

Stress-strain (isochronous) 140°C (dry)



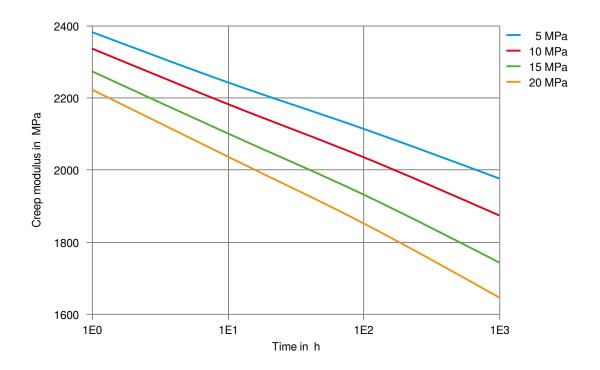
Printed: 2025-05-29 Page: 17 of 20





### MINERAL REINFORCED NYLON RESIN

Creep modulus-time 140°C (dry)



Printed: 2025-05-29 Page: 18 of 20

(+) 18816996168 Ponciplastics.com



## Minlon® EFE6053 BK413

#### MINERAL REINFORCED 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
- 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

#### 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

Printed: 2025-05-29 Page: 19 of 20





#### MINERAL REINFORCED NYLON RESIN

- ✓ 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
- ★ 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).

Printed: 2025-05-29 Page: 20 of 20

Revised: 2025-04-18 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. 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

© 2025 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. Fortron is a registered trademark of Fortron Industries LLC.