

#### **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® 70G25HSL is a 25% glass fibre reinforced, heat stabilised polyamide 66 resin for injection moulding.

#### **Product information**

Resin Identification Part Marking Code ISO designation Infrared spectrum	PA66-GF25 >PA66-GF25< ISO 16396-PA66 available	3,GF25,M1GHNR,S14-080	ISO 1043 ISO 11469
TGA curve	available	•	ISO 11359-1/-2
Rheological properties	dry/cond.		
Viscosity number	150/*	cm <sup>3</sup> /g	ISO 307, 1157, 1628
Moulding shrinkage, parallel	0.3/-	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.1/-	%	ISO 294-4, 2577
Typical mechanical properties	dry/cond.		
Tensile Modulus	8500/6000	MPa	ISO 527-1/-2
Stress at break, 5mm/min	180/120	MPa	ISO 527-1/-2
Strain at break, 5mm/min	3/5	%	ISO 527-1/-2
Flexural Modulus	8000/-	MPa	ISO 178
Flexural Strength	260/-	MPa	ISO 178
Tensile creep modulus, 1h	*/5000	MPa	ISO 899-1
Tensile creep modulus, 1000h	*/4100	MPa	ISO 899-1
Charpy impact strength, 23°C	60/80	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	50/50	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	10/12	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	10/11	kJ/m <sup>2</sup>	ISO 179/1eA
Izod notched impact strength, 23°C	10/11	kJ/m²	ISO 180/1A
Izod notched impact strength, -30°C	8/8	kJ/m²	ISO 180/1A
Izod impact strength, 23°C	50/80	kJ/m²	ISO 180/1U
Izod impact strength, -30°C	50/50	kJ/m²	ISO 180/1U
Hardness, Rockwell, M-scale	103/87		ISO 2039-2
Hardness, Rockwell, R-scale	123/116		ISO 2039-2

Printed: 2023-10-03 Page: 1 of 10

Revised: 2023-02-14 Source: Celanese Materials Database



#### **NYLON RESIN**

Ball indentation hardness, H 961/30 Poisson's ratio	260/- 0.34/0.35	MPa	ISO 2039-1
Thermal properties	dry/cond.		
Melting temperature, 10°C/min Glass transition temperature, 10°C/min Temp. of deflection under load, 1.8 MPa Temp. of deflection under load, 0.45 MPa Vicat softening temperature, 50°C/h, 50N Coeff. of linear therm. expansion, parallel, -40-23°C Coeff. of linear therm. expansion, parallel Coeff. of linear therm. expansion, parallel	263/* 80/25 240/* 260/* 260/* 34/* 33/* 18/*	°C °C °C °C E-6/K E-6/K E-6/K	ISO 11357-1/-3 ISO 11357-1/-3 ISO 75-1/-2 ISO 75-1/-2 ISO 306 ISO 11359-1/-2 ISO 11359-1/-2 ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, -40-23°C Coeff. of linear therm. expansion, normal	75/* 112/*	E-6/K E-6/K	ISO 11359-1/-2 ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, 55-160°C Thermal conductivity of melt Spec. heat capacity of melt RTI, electrical, 0.75mm RTI, electrical, 1.5mm RTI, electrical, 3mm RTI, impact, 0.75mm RTI, impact, 1.5mm RTI, impact, 1.5mm RTI, strength, 0.75mm RTI, strength, 1.5mm	130/* 0.21 2090 140 140 140 125 125 125 140 140/* 140	E-6/K W/(m K) J/(kg K) °C °C °C °C °C °C	ISO 11359-1/-2 Internal Internal UL 746B
RTI, strength, 3mm  Flammability		°C	UL 746B
Burning Behav. at 1.5mm nom. thickn. Thickness tested UL recognition Burning Behav. at thickness h Thickness tested UL recognition Glow Wire Flammability Index, 1mm Glow Wire Flammability Index, 2mm Glow Wire Flammability Index, 3mm FMVSS Class Burning rate, Thickness 1 mm	dry/cond.  HB/*  1.5/* yes/*  HB/*  0.71/* yes/*  650/- 650/- 750/- SE/B 18	class mm class mm °C °C °C	UL 94 UL 94 UL 94 UL 94 UL 94 UL 94 IEC 60695-2-12 IEC 60695-2-12 IEC 60695-2-12 ISO 3795 (FMVSS 302) ISO 3795 (FMVSS 302)

Printed: 2023-10-03 Page: 2 of 10

Revised: 2023-02-14 Source: Celanese Materials Database



#### **NYLON RESIN**

Electrical properties	dry/cond.		
Relative permittivity, 1MHz	4.1/4.5		IEC 62631-2-1
Dissipation factor, 1MHz	150/730	E-4	IEC 62631-2-1
Volume resistivity	>1E13/1E9	Ohm.m	IEC 62631-3-1
Surface resistivity	*/1E13	Ohm	IEC 62631-3-2
Comparative tracking index	400/-		IEC 60112
Electric Strength, Short Time, 1mm	24/-	kV/mm	IEC 60243-1
Other properties	dry/cond.		
Humidity absorption, 2mm	2/*	%	Sim. to ISO 62
Water absorption, 2mm	6.4/*	%	Sim. to ISO 62
Water absorption, Immersion 24h	1.4/*	%	Sim. to ISO 62
Density	1330/-	kg/m³	ISO 1183
Injection			
Drying Recommended	yes		
Drying Temperature	80	°C	
Drying Time, Dehumidified Dryer	2 - 4	h	
Processing Moisture Content	≤0.2	%	
Melt Temperature Optimum	295		Internal
Min. melt temperature	285		
Max. melt temperature	305		
Max. screw tangential speed	≤0.2		
Mold Temperature Optimum	100		
Min. mould temperature		°C	
Max. mould temperature	120		
Hold pressure range	50 - 100		
Hold pressure time		s/mm	
Ejection temperature	210	°C	Internal

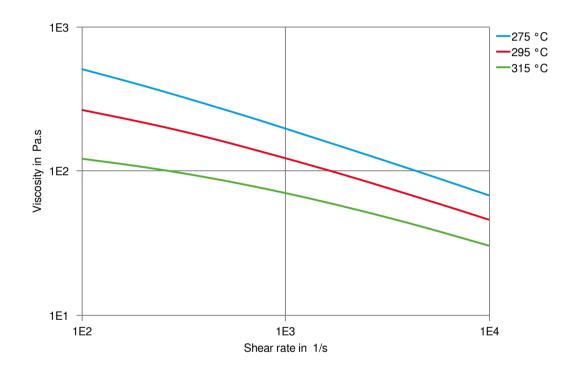
#### Characteristics

Additives Release agent

Printed: 2023-10-03 Page: 3 of 10



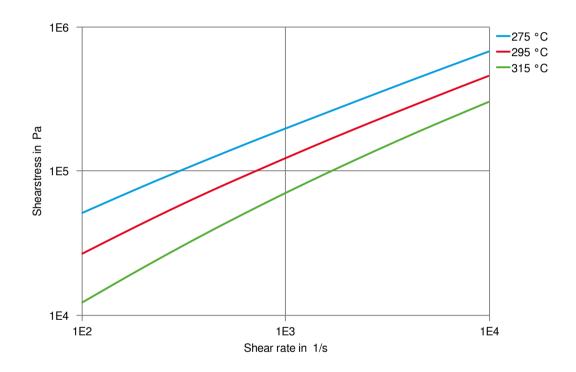
Viscosity-shear rate



Printed: 2023-10-03 Page: 4 of 10



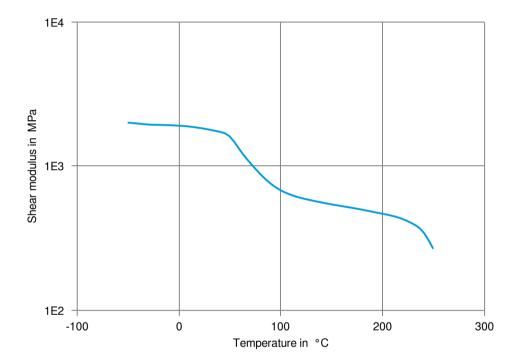
Shearstress-shear rate



Printed: 2023-10-03 Page: 5 of 10



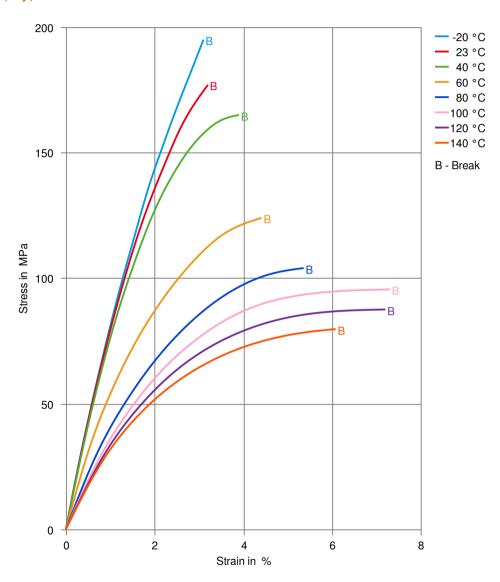
Dynamic Shear modulus-temperature (dry)



Printed: 2023-10-03 Page: 6 of 10



Stress-strain (dry)

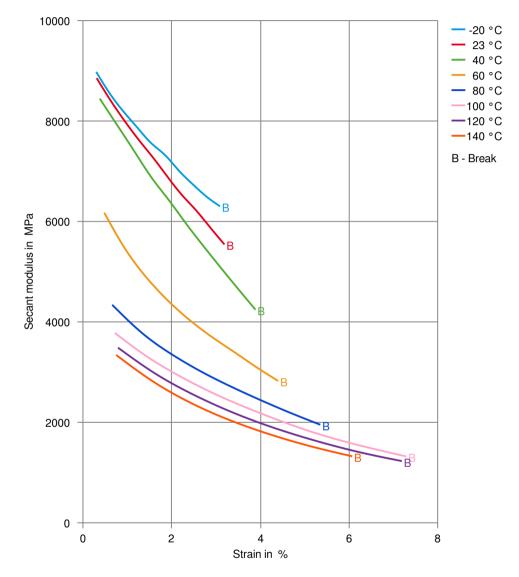


Printed: 2023-10-03 Page: 7 of 10



### Zytel® 70G25HSL NC010 **NYLON RESIN**

#### Secant modulus-strain (dry)



Printed: 2023-10-03 Page: 8 of 10



#### **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
- ✓ Motor oil OS206 304 Ref.Eng.Oil, ISP, 135°C
- ✓ Automatic hypoid-gear oil Shell Donax TX, 135°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

Printed: 2023-10-03 Page: 9 of 10



#### **NYLON RESIN**

- ✓ 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
- X 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
- ✓ DOT No. 4 Brake fluid, 120°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
- X 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: 2023-10-03 Page: 10 of 10

Revised: 2023-02-14 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 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

© 2023 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. KEPITAL is a registered trademark of Korea Engineering Plastics Company, Ltd.