

### **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® ST801 NC010 is an Unreinforced, Super Toughened, Polyamide 66

#### **Product information**

1 Toddet imorriation			
Resin Identification	PA66-HI		ISO 1043
Part Marking Code	>PA66-HI<		ISO 11469
ISO designation	ISO 16396-PA66-I,,M1G1L1NR,S14-020		
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Rheological properties	dry/cond.		
Moulding shrinkage, parallel	1.8/-	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.4/-	%	ISO 294-4, 2577
Typical mechanical properties	dry/cond.		
Tensile modulus	2000/900	MPa	ISO 527-1/-2
Tensile stress at yield, 50mm/min	50/43	MPa	ISO 527-1/-2
Tensile strain at yield, 50mm/min	5.7/37	%	ISO 527-1/-2
Nominal strain at break	40/>50	%	ISO 527-1/-2
Flexural modulus	1800/700	MPa	ISO 178
Flexural strength	68/-	MPa	ISO 178
Charpy impact strength, 23°C	N/N	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	N/N	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	80/115	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	18/17	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C	80/90	kJ/m²	ISO 180/1A
Izod notched impact strength, -30°C	20.0/20.0	kJ/m²	ISO 180/1A
Hardness, Rockwell, R-scale	112/89		ISO 2039-2
Poisson's ratio	0.4/0.45		
Thermal properties	dry/cond.		
Melting temperature, 10 ° C/min	263/*	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	75/20	°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	64/*	°C	ISO 75-1/-2
Temperature of deflection under load, 1.8 MPa,	71/*	°C	ISO 75-1/-2
annealed			
Temperature of deflection under load, 0.45 MPa	132/*	°C	ISO 75-1/-2
Ball pressure test	220/-	°C	IEC 60695-10-2

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### NYLON RESIN

Coefficient of linear thermal expansion	120/*	E-6/K	ISO 11359-1/-2
(CLTE), parallel		= - " (	
CLTE, Parallel, 23-55°C(73-130°F)	120/-	E-6/K	ASTM E 831
Coefficient of linear thermal expansion (CLTE),	90/*	E-6/K	ISO 11359-1/-2
normal			
Coefficient of linear thermal expansion	90/-	E-6/K	ASTM E 831
(CLTE), Normal,23-55°C			
(73-130°F)			
RTI, electrical, 0.75mm	125	°C	UL 746B
RTI, electrical, 1.5mm	125	°C	UL 746B
RTI, electrical, 3.0mm	125	°C	UL 746B
RTI, impact, 0.75mm	75	°C	UL 746B
RTI, impact, 1.5mm	75	°C	UL 746B
RTI, impact, 3.0mm	75	°C	UL 746B
RTI, strength, 0.75mm	85	°C	UL 746B
RTI, strength, 1.5mm	85/*	°C	UL 746B
RTI, strength, 3.0mm	85	°C	UL 746B
Hot mandrel	0/-		IEC 60695-10-2
Flammability	dry/cond.		
Burning Behav. at 1.5mm nom. thickn.	HB/*	class	IEC 60695-11-10
Thickness tested	1.5/*	mm	IEC 60695-11-10
UL recognition	yes/*	111111	UL 94
Burning Behav. at thickness h	yes/ HB/*	class	IEC 60695-11-10
Thickness tested	0.81/*	mm	IEC 60695-11-10
UL recognition	yes/*	111111	UL 94
	20/*	%	ISO 4589-1/-2
Oxygen index	750/-	°C	
Glow Wire Flammability Index, 0.75mm		°C	IEC 60695-2-12
Glow Wire Flammability Index, 1.5mm	750/-	°C	IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	750/-	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 0.75mm	725/-		IEC 60695-2-13
Glow Wire Ignition Temperature, 1.5mm	725/-	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 3.0mm	725/-	°C	IEC 60695-2-13
FMVSS Class	В	, .	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<80	mm/min	ISO 3795 (FMVSS 302)
Hot Wire Ignition, 0.75mm	9/*	S	UL 746A
Hot Wire Ignition, 1.5mm	15/*	S	UL 746A
Hot Wire Ignition, 3mm	20/*	S	UL 746A
Electrical properties	dry/cond.		
Relative permittivity, 100Hz	3.2/5.5		IEC 62631-2-1
Relative permittivity, 1MHz	2.9/3.2		IEC 62631-2-1
Dissipation factor, 100Hz	80/1800	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	140/550	E-4	IEC 62631-2-1
Volume resistivity	1E12/1E11	Ohm.m	IEC 62631-3-1
Surface resistivity	*/>1E15	Ohm	IEC 62631-3-2
Electric strength	31/-	kV/mm	IEC 60243-1
Comparative tracking index	600/-		IEC 60112
Arc Resistance	131/*	S	UL 746B
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### **NYLON RESIN**

High Amperage Arc Ignition Resistance, 0.75 mm	200/*	arcs	UL 746A
High Amperage Arc Ignition Resistance, 1.5 mm	200/*	arcs	UL 746A
High Amperage Arc Ignition Category, 1.5 mm	200/*	class	UL 746A
High Voltage Arc Tracking Rate	7.6/*	mm/min	UL 746A

#### Physical/Other properties

Humidity absorption, 2mm	2/*	%	Sim. to ISO 62
Water absorption, 2mm	6.5/*	%	Sim. to ISO 62
Water absorption, Immersion 24h	1.2 <sup>[1]</sup> /*	%	Sim. to ISO 62
Density	1080/-	kg/m³	ISO 1183
Density of melt	920	kg/m <sup>3</sup>	

dry/cond.

[1]: 3mm wall thickness

### Injection

Drying Recommended	yes	
Drying Temperature	80	°C
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.2	%
Melt Temperature Optimum	290	°C
Min. melt temperature	280	°C
Max. melt temperature	300	°C
Screw tangential speed	≤0.3	m/s
Mold Temperature Optimum	80	°C
Min. mould temperature	50	°C
Max. mould temperature	100	°C
Hold pressure range	50 - 100	MPa
Hold pressure time	4	s/mm
Back pressure	As low as	MPa
	possible	
Ejection temperature	190	°C

#### Extrusion

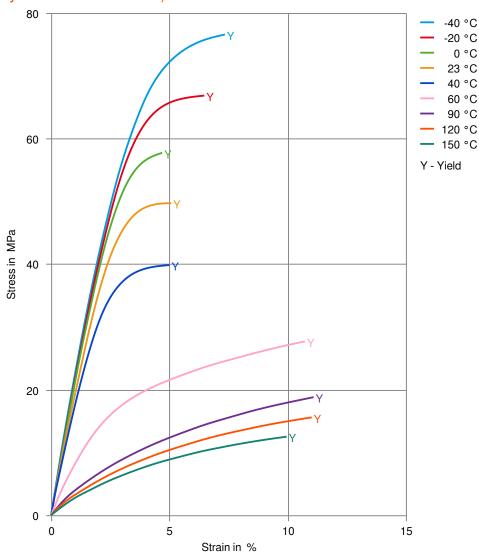
Drying Temperature	80	°C
Drying Time, Dehumidified Dryer	3 - 4	h
Processing Moisture Content	≤0.06	%
Melt Temperature Optimum	280	°C
Melt Temperature Range	275 - 290	°C

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**NYLON RESIN** 

Stress-strain (dry) (measured on Zytel® ST801 BK010A)

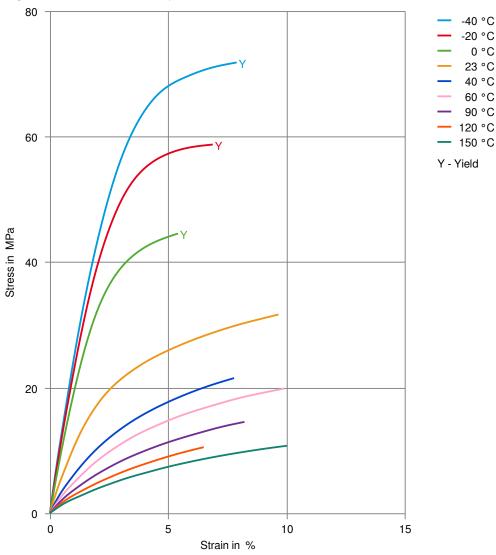


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**NYLON RESIN** 

Stress-strain (cond.) (measured on Zytel® ST801 BK010A)

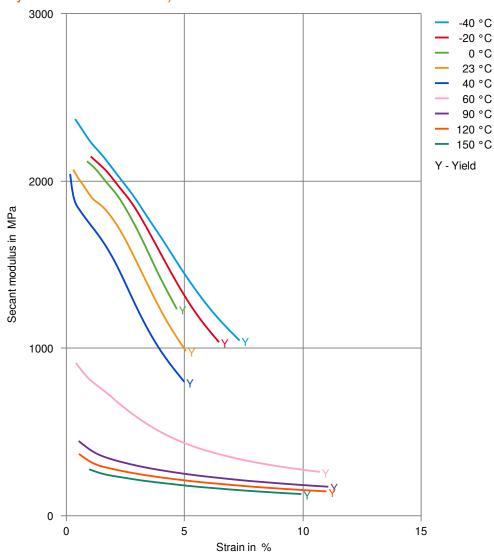


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**NYLON RESIN** 

Secant modulus-strain (dry) (measured on Zytel® ST801 BK010A)

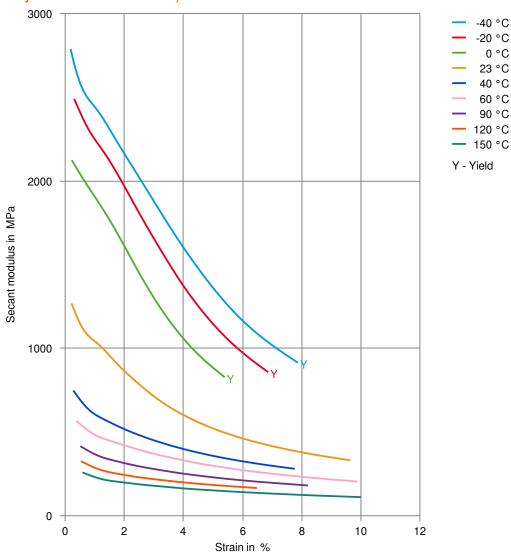


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**NYLON RESIN** 

Secant modulus-strain (cond.) (measured on Zytel® ST801 BK010A)

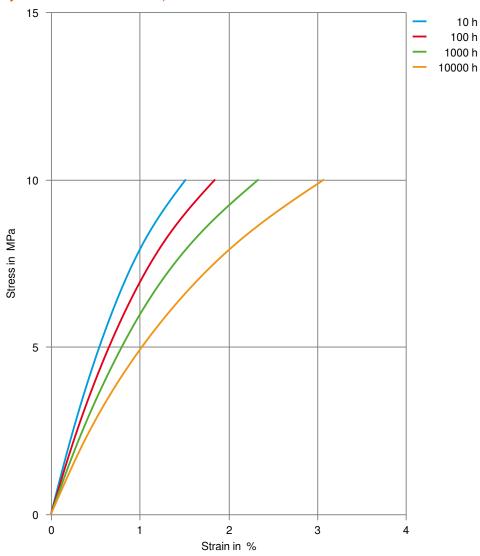


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**NYLON RESIN** 

Stress-strain (isochronous) 23°C (cond.) (measured on Zytel® ST801 NC010A)

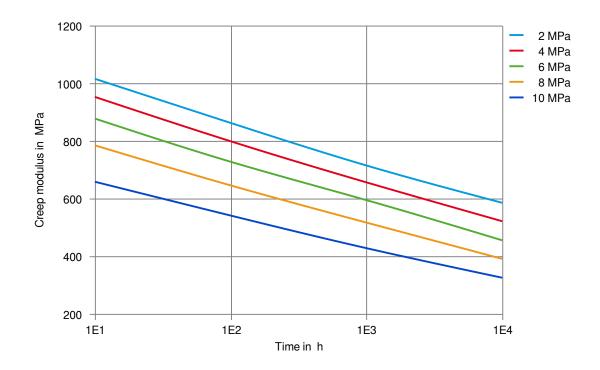


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NYLON RESIN

Creep modulus-time 23°C (cond.) (measured on Zytel® ST801 NC010A)



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#### **NYLON RESIN**

#### Chemical Media Resistance

#### **Alcohols**

- ✓ Isopropyl alcohol, 23°C
- ✓ Methanol, 23°C
- ✓ Ethanol, 23°C

#### Standard Fuels

✓ Standard fuel without alcohol (pref. ISO 1817 Liquid C), 23°C

#### Other

- ✓ Water, 23°C
- ✓ Water, 90°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).

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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 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

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