

# Zytel® 70G25HSL NC010

## 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	PA66-GF25	ISO 1043
Part Marking Code	>PA66-GF25<	ISO 11469
ISO designation	ISO 16396-PA66,GF25,M1GHNR,S14-080	
Infrared spectrum	available	
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/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength, -30°C	50 / 50	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, 23°C	10 / 12	kJ/m <sup>2</sup>	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/m <sup>2</sup>	ISO 180/1A
Izod notched impact strength, -30°C	8 / 8	kJ/m <sup>2</sup>	ISO 180/1A
Izod impact strength, 23°C	50 / 80	kJ/m <sup>2</sup>	ISO 180/1U
Izod impact strength, -30°C	50 / 50	kJ/m <sup>2</sup>	ISO 180/1U
Hardness, Rockwell, M-scale	103 / 87		ISO 2039-2
Hardness, Rockwell, R-scale	123 / 116		ISO 2039-2

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Ball indentation hardness, H 961/30	260/-	MPa	ISO 2039-1
Poisson's ratio	0.34/0.35		

### Thermal properties

	dry/cond.		
Melting temperature, 10°C/min	263/*	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	80/25	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	240/*	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	260/*	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h, 50N	260/*	°C	ISO 306
Coeff. of linear therm. expansion, parallel, -40-23°C	34/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel	33/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, parallel, 55-160°C	18/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, -40-23°C	75/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	112/*	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, 55-160°C	130/*	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.21	W/(m K)	Internal
Spec. heat capacity of melt	2090	J/(kg K)	Internal
RTI, electrical, 0.75mm	140	°C	UL 746B
RTI, electrical, 1.5mm	140	°C	UL 746B
RTI, electrical, 3mm	140	°C	UL 746B
RTI, impact, 0.75mm	125	°C	UL 746B
RTI, impact, 1.5mm	125	°C	UL 746B
RTI, impact, 3mm	125	°C	UL 746B
RTI, strength, 0.75mm	140	°C	UL 746B
RTI, strength, 1.5mm	140/*	°C	UL 746B
RTI, strength, 3mm	140	°C	UL 746B

### Flammability

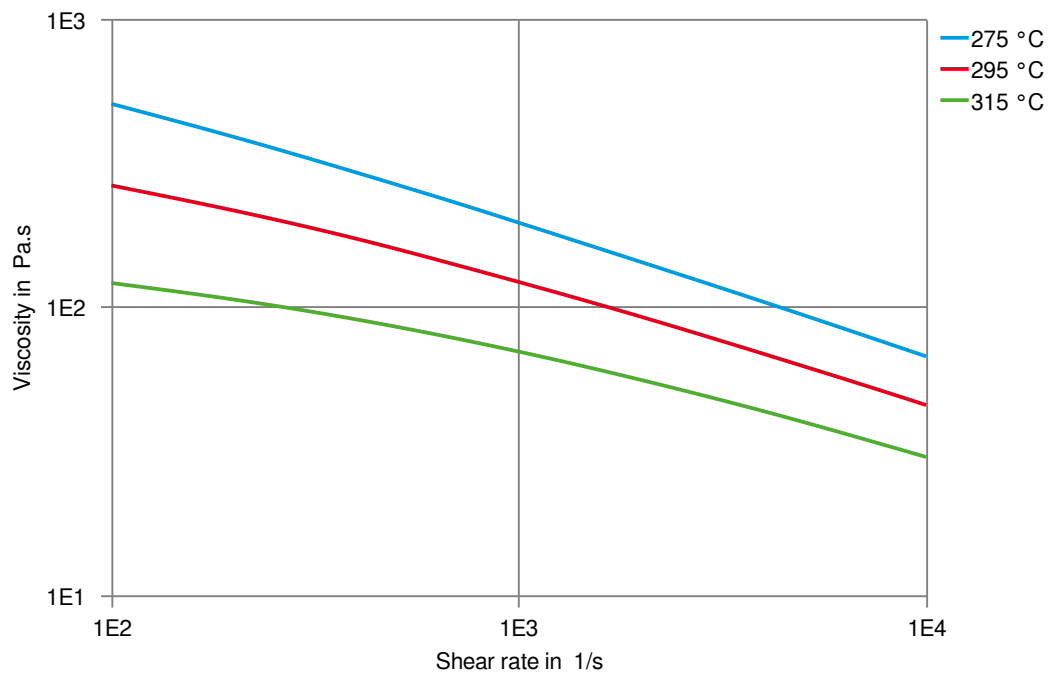
	dry/cond.		
Burning Behav. at 1.5mm nom. thickn.	HB/*	class	UL 94
Thickness tested	1.5/*	mm	UL 94
UL recognition	yes/*		UL 94
Burning Behav. at thickness h	HB/*	class	UL 94
Thickness tested	0.71/*	mm	UL 94
UL recognition	yes/*		UL 94
Glow Wire Flammability Index, 1mm	650/-	°C	IEC 60695-2-12
Glow Wire Flammability Index, 2mm	650/-	°C	IEC 60695-2-12
Glow Wire Flammability Index, 3mm	750/-	°C	IEC 60695-2-12
FMVSS Class	SE/B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	18	mm/min	ISO 3795 (FMVSS 302)



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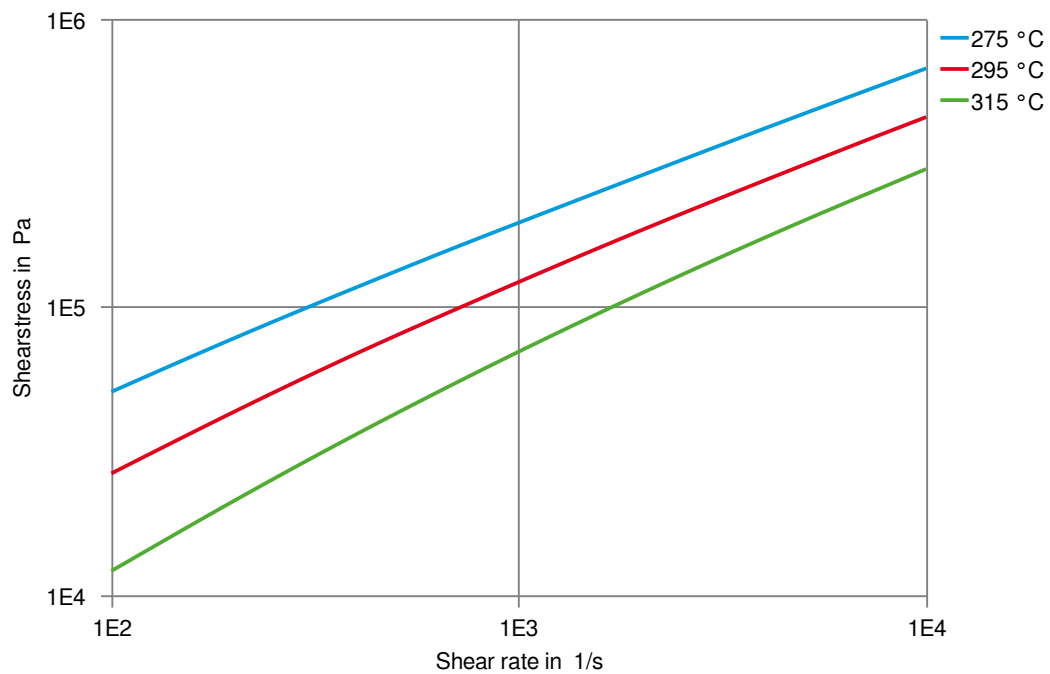
Viscosity-shear rate



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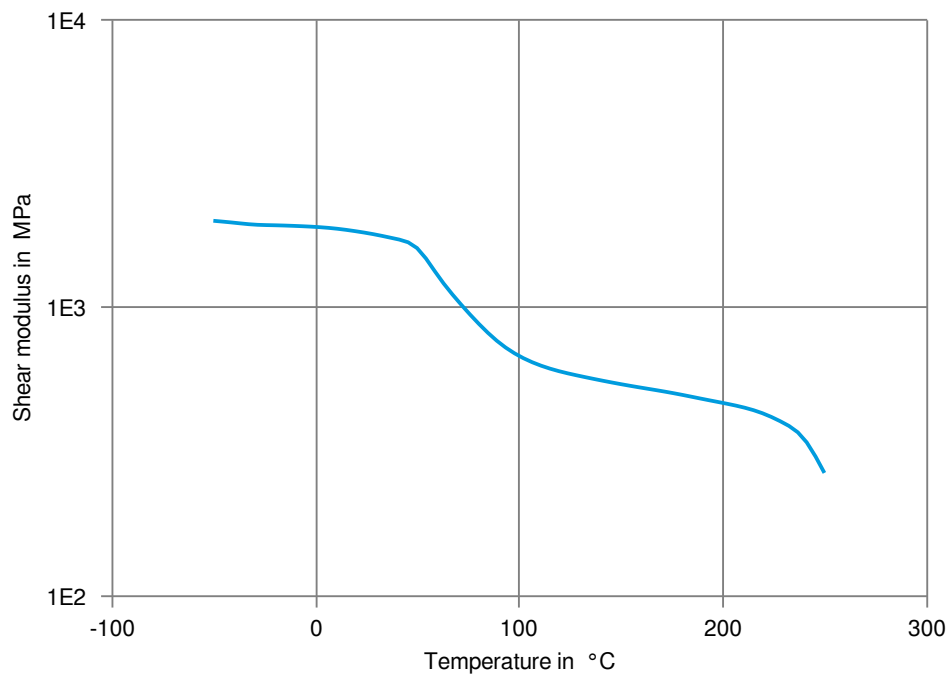
Shearstress-shear rate



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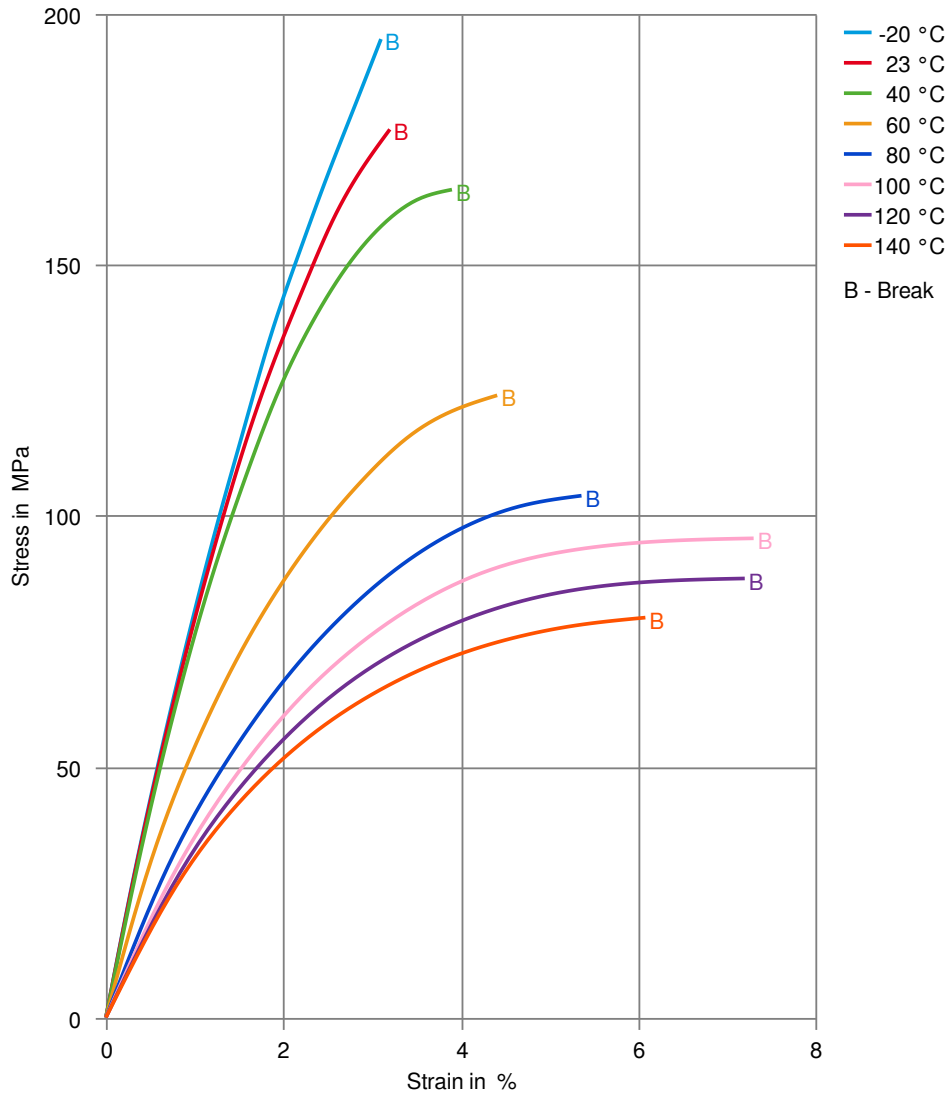
Dynamic Shear modulus-temperature (dry)



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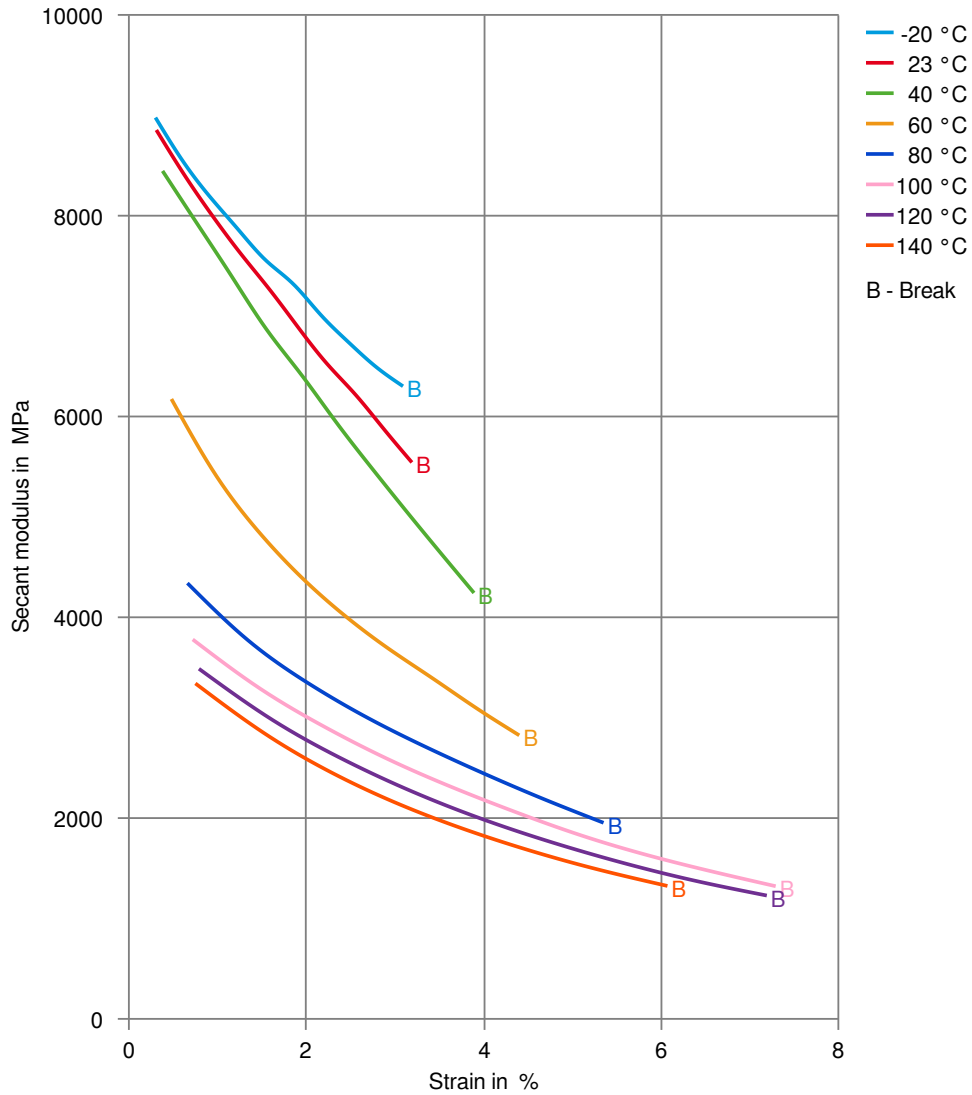
Stress-strain (dry)



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Secant modulus-strain (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
- ✗ 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
- ✓ 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

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- ✓ 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
- ✓ 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
- ✓ 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
- ✗ 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).