



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® E51HSB NC010 is a high molecular weight, heat stabilised polyamide 66 resin for injection moulding and extrusion.

Product information

Resin Identification	PA66	2	100 4040
Dort Marking Code	PA66		ISO 1043
Part Marking Code	>PA66<		ISO 11469
ISO designation	ISO 16396-PA66,,M1G1HNR,S32-030		
Rheological properties	dry/cond.		
	*	am3/a	100 007 1600
•		•	
5 . .			
	1.3/-	76	150 294-4, 2377
[1]: 90% formic acid			
Typical mechanical properties	dry/cond.		
Tensile modulus	3100/1200	MPa	ISO 527-1/-2
Tensile stress at yield, 50mm/min	84/55	MPa	ISO 527-1/-2
Tensile strain at yield, 50mm/min	4.3/29	%	ISO 527-1/-2
Nominal strain at break	35/-	%	ISO 527-1/-2
Tensile strain at break, 50mm/min	>50/-	%	ISO 527-1/-2
Flexural modulus	2800/-	MPa	ISO 178
Flexural stress at 3.5%	95/-	MPa	ISO 178
Charpy impact strength, 23°C	N/-	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	5.5/21	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C	6/-	kJ/m²	ISO 180/1A
Poisson's ratio	0.37/0.44		
Thermal properties	dry/cond.		
	,	°C.	ISO 11357-1/-3
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·			
Tensile modulus Tensile stress at yield, 50mm/min Tensile strain at yield, 50mm/min Nominal strain at break Tensile strain at break, 50mm/min Flexural modulus Flexural stress at 3.5% Charpy impact strength, 23°C Charpy notched impact strength, 23°C Izod notched impact strength, 23°C	3100/1200 84/55 4.3/29 35/- >50/- 2800/- 95/- N/- 5.5/21 6/-	MPa % % % MPa MPa kJ/m ² kJ/m ²	ISO 527-1/-2 ISO 527-1/-2 ISO 527-1/-2 ISO 527-1/-2 ISO 178 ISO 178 ISO 179/1eU ISO 179/1eA

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NYLON RESIN

Coefficient of linear thermal expansion	100/*	E-6/K	ISO 11359-1/-2
(CLTE), parallel Coefficient of linear thermal expansion (CLTE),	100/*	E-6/K	ISO 11359-1/-2
normal Thermal conductivity of melt	0.16	W/(m K)	ISO 22007-2
Specific heat capacity of melt	2790	J/(kg K)	ISO 22007-4
Flammability	dry/cond.		
Oxygen index	20/*	%	ISO 4589-1/-2
FMVSS Class Burning rate, Thickness 1 mm	DNI	mm/min	ISO 3795 (FMVSS 302) ISO 3795 (FMVSS 302)
burning rate, friickness i film		11111/111111	130 3793 (1 101033 302)
Electrical properties	dry/cond.		
Volume resistivity	>1E13/1E11	Ohm.m	IEC 62631-3-1
Comparative tracking index	600/-		IEC 60112
Physical/Other properties	dry/cond.		
Humidity absorption, 2mm	2.6/*	%	Sim. to ISO 62
Water absorption, 2mm	8.5/*	%	Sim. to ISO 62
Density	1140/-	kg/m³	ISO 1183
Density of melt	980	kg/m³	
Injection			
Drying Recommended	yes		
Drying Temperature		°C	
Drying Time, Dehumidified Dryer	2 - 4		
Processing Moisture Content	≤0.05 290 ^[2]		
Melt Temperature Optimum Min. melt temperature	280		
Max. melt temperature	300		
Screw tangential speed	≤0.4		
Mold Temperature Optimum	70	°C	
Min. mould temperature		°C	
Max. mould temperature		°C	
Hold pressure range	50 - 100		
Hold pressure time Ejection temperature	200	s/mm °C	
[2]: optimum 290 °C to 300°C	200	O	
[-]. Spanian 200 0 to 000 0			
Extrusion			
Drying Temperature		°C	
Drying Time, Dehumidified Dryer	4 - 6	h	

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≤0.05 %

285 °C 280 - 290 °C

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Processing Moisture Content

Melt Temperature Optimum

Melt Temperature Range





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Characteristics

Processing Injection Moulding, Film Extrusion, Extrusion, Sheet Extrusion, Other Extrusion,

Coatable, Casting

Delivery form Pellets

Additives Release agent

Special characteristics Heat stabilised or stable to heat

Automotive

OEM STANDARD

VW Group VW 50133 PA66-1-A

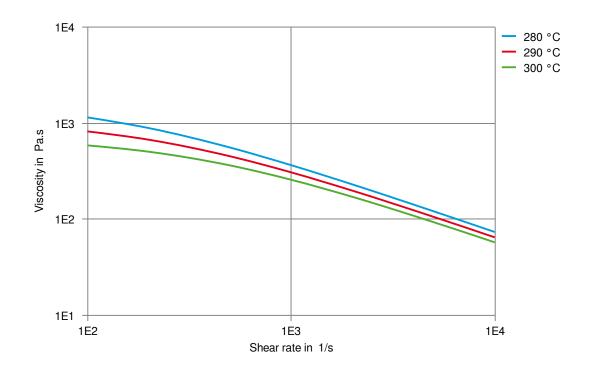
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Viscosity-shear rate

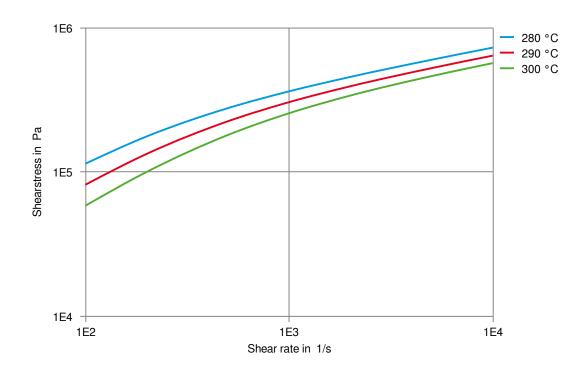


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Shearstress-shear rate



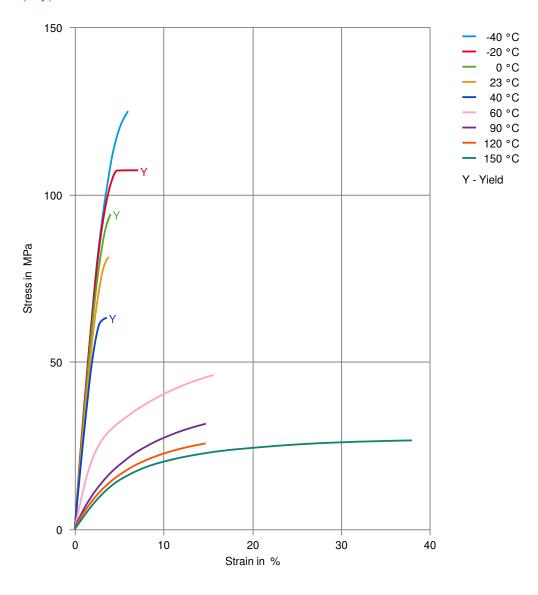
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Stress-strain (dry)



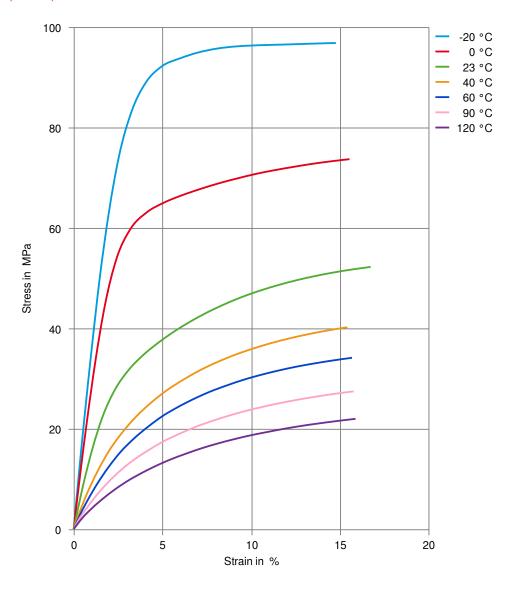
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Stress-strain (cond.)



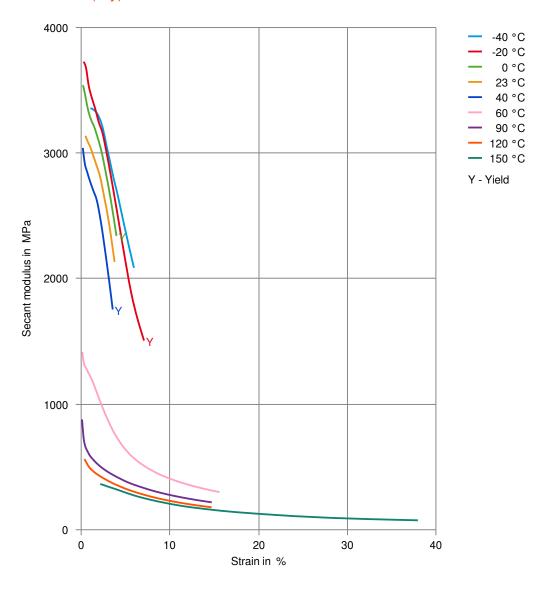
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Secant modulus-strain (dry)



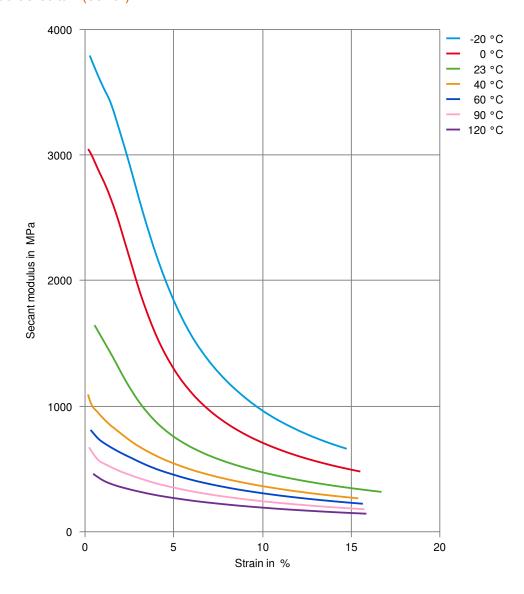
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Secant modulus-strain (cond.)



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Zytel® E51HSB NC010

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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
- 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
- X 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

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- ✓ 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).

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