

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® 80G33HS1L NC010 is a 33% glass fiber reinforced heat stabilized polyamide 66 resin with outstanding impact resistance developed using our Super Tough technology.

Product information

Resin Identification Part Marking Code ISO designation	PA66-IGF33 >PA66-IGF33< ISO 16396-PA66	3 3-I,GF33,M1GHNR,S14-090	ISO 1043 ISO 11469
Rheological properties	dry/cond.		
Viscosity number	144 ^[1] /*	cm ³ /g	ISO 307, 1628
Moulding shrinkage, parallel	0.3/-	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.7/-	%	ISO 294-4, 2577
[1]: sulfuric acid 96%			
Typical mechanical properties	dry/cond.		
Tensile modulus	8900/6200	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	146/108	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	3.7/7	%	ISO 527-1/-2
Flexural modulus	7500/6200	MPa	ISO 178
Flexural strength	200/-	MPa	ISO 178
Tensile creep modulus, 1h	*/5300	MPa	ISO 899-1
Tensile creep modulus, 1000h	*/4300	MPa	ISO 899-1
Charpy impact strength, 23°C	97/98	kJ/m²	ISO 179/1eU
Charpy impact strength, -30 °C	106/100	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	20/28	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	18/17	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40°C	14/18	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C	21/26	kJ/m²	ISO 180/1A
Izod notched impact strength, -30 °C	17.0/16.0	kJ/m²	ISO 180/1A
Izod notched impact strength, -40°C	15.0/15.0	kJ/m²	ISO 180/1A
Izod impact strength, 23°C	80/80	kJ/m²	ISO 180/1U
Izod impact strength, -30 °C	80/75	kJ/m²	ISO 180/1U
Hardness, Rockwell, M-scale	70/-		ISO 2039-2
Hardness, Rockwell, R-scale	110/-		ISO 2039-2
Ball indentation hardness, H 961/30	220/-	MPa	ISO 2039-1
Poisson's ratio	0.34/0.35		

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Thermal properties	dry/cond.		
Melting temperature, 10°C/min	262/*	°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	246/*	°C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	261/*	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N	245/*	°C	ISO 306
Coefficient of linear thermal expansion	15/*	E-6/K	ISO 11359-1/-2
(CLTE), parallel			
Coefficient of linear thermal expansion (CLTE),	120/*	E-6/K	ISO 11359-1/-2
normal			
Thermal conductivity of melt	0.22	W/(m K)	ISO 22007-2
Effective thermal diffusivity, flow	9E-8	m²/s	ISO 22007-4
Specific heat capacity of melt	2200	J/(kg K)	ISO 22007-4
RTI, electrical, 0.75mm	130	°Č Ú	UL 746B
RTI, electrical, 1.5mm	130	°C	UL 746B
RTI, electrical, 3.0mm	130	°C	UL 746B
RTI, impact, 0.75mm	65	°C	UL 746B
RTI, impact, 1.5mm	105	°C	UL 746B
RTI, impact, 3.0mm	105	°C	UL 746B
RTI, strength, 0.75mm	85	°C	UL 746B
RTI, strength, 1.5mm	95/*	°C	UL 746B
RTI, strength, 3.0mm	105	°C	UL 746B
Flommobility			
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 ^[2] /*		UL 94
Burning Behav. at thickness h	HB/*	class	IEC 60695-11-10
Thickness tested	0.75/*	mm	IEC 60695-11-10
UL recognition	yes/*		UL 94
Glow Wire Flammability Index, 1.0mm	650/-	°C	IEC 60695-2-12
Glow Wire Flammability Index, 2.0mm	700/-	°C	IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	900/-	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 1.0mm	700/-	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 2.0mm	700/-	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 3.0mm	750/-	°C	IEC 60695-2-13
FMVSS Class	SE/B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	23	mm/min	ISO 3795 (FMVSS 302)
[2]: UL yellow card with (f1)			
Electrical properties	dry/cond.		
Relative permittivity, 1MHz	3.6/4.3		IEC 62631-2-1
Dissipation factor, 1MHz	130/600	E-4	IEC 62631-2-1
Volume resistivity	>1E13/1E9	L-4 Ohm.m	IEC 02031-2-1 IEC 62631-3-1
Surface resistivity	*/1E12	Ohm	IEC 62631-3-2
Comparative tracking index	-/425	Unit	IEC 60112
	-/423		

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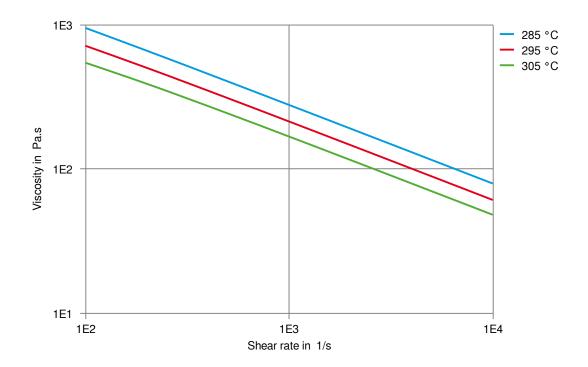
Physical/Other properties Humidity absorption, 2mm Water absorption, 2mm Water absorption, Immersion 24h Density Density of melt	dry/cond. 1.5/* 4.5/* 0.85/* 1330/- 1120	% % Kg/m ³ kg/m ³	Sim. to ISO 62 Sim. to ISO 62 Sim. to ISO 62 ISO 1183	
VDA Properties	dry/cond.			
Emission of organic compounds Odour Fogging, G-value (condensate)	25 3 0.8/*	μgC/g class mg	VDA 277 VDA 270 ISO 6452	
Injection				
Drying Recommended Drying Temperature Drying Time, Dehumidified Dryer Processing Moisture Content Melt Temperature Optimum Min. melt temperature Max. melt temperature Screw tangential speed Mold Temperature Optimum Min. mould temperature Max. mould temperature Hold pressure range Hold pressure time Ejection temperature	2 - 4 ≤0.2 295 280 310 ≤0.2 70 40 90 50 - 100	°C h % °C °C °C m/s °C °C °C % C MPa s/mm		
Characteristics				
Processing	Injection Moulding			
Delivery form	Pellets			
Additives	Release agent			
Special characteristics	High impact or impact modified, Heat stabilised or stable to heat			
Automotive				
OEM Ford	STANDARD WSS-M4D703-B1	ADDITIONAL INFORMATION	١	
General Motors	GMW17263P-PA66-GF35	Natural		

VW 50127 PA66-011

VW Group

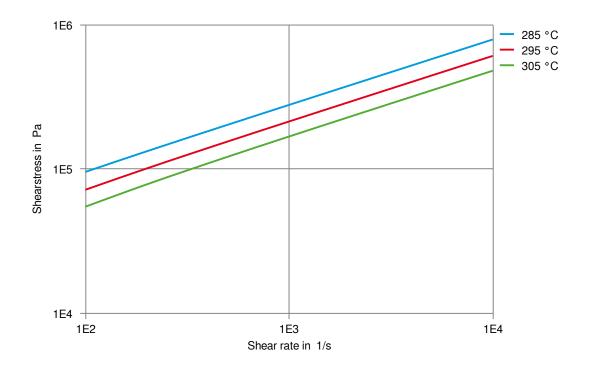


Viscosity-shear rate



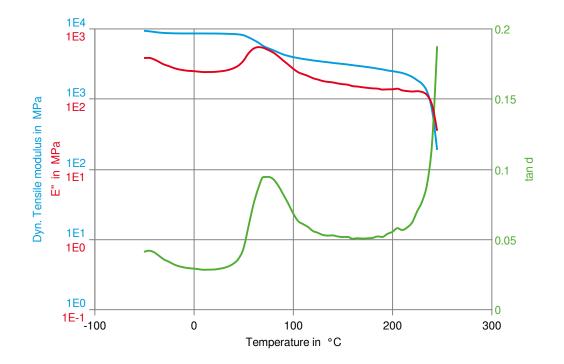


Shearstress-shear rate



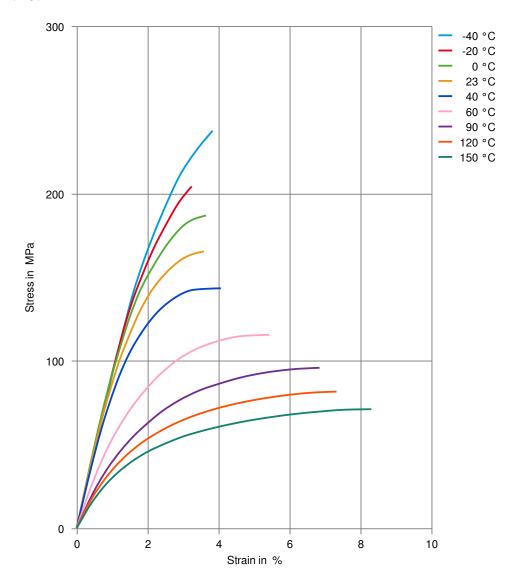


Dynamic Tensile modulus-temperature (dry)



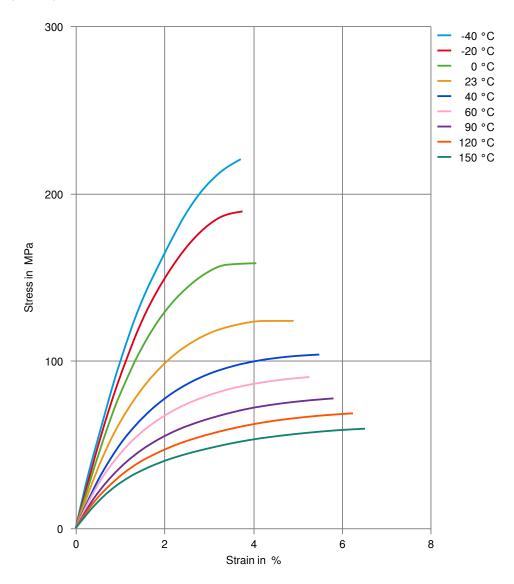


Stress-strain (dry)



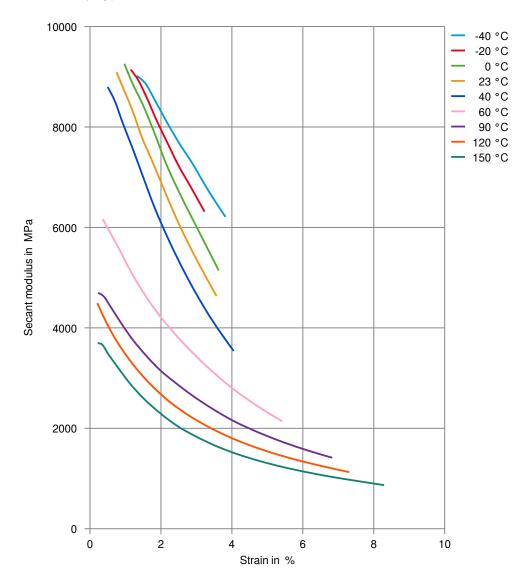


Stress-strain (cond.)



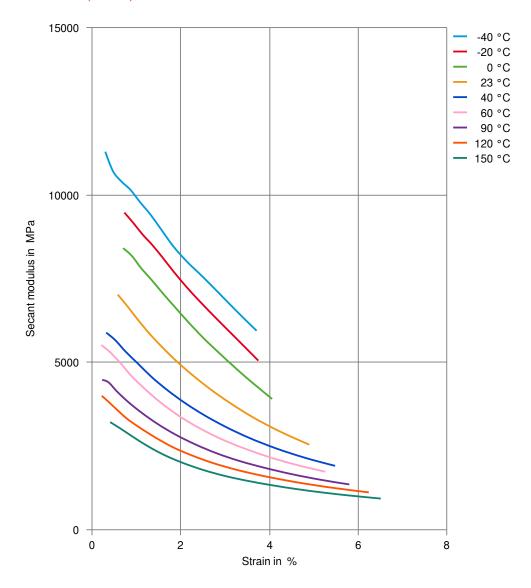


Secant modulus-strain (dry)



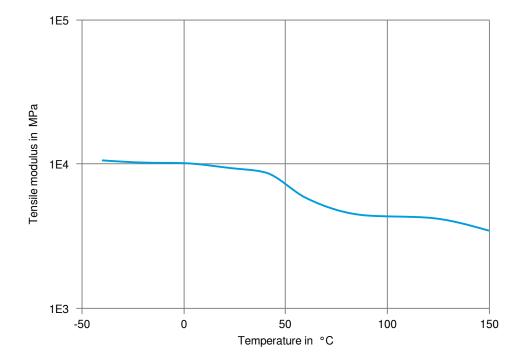


Secant modulus-strain (cond.)



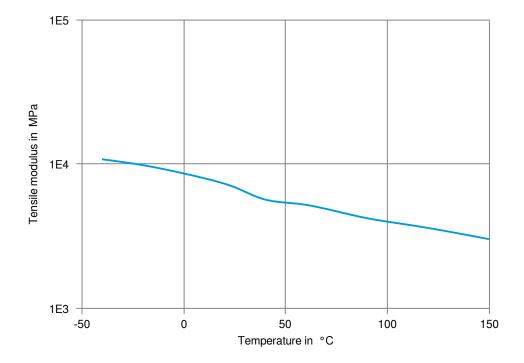


Tensile modulus-temperature (dry)





Tensile modulus-temperature (cond.)





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
- X Nitric Acid (40% by mass), 23°C
- X Sulfuric Acid (38% by mass), 23 °C
- X 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

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
- ★ 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
- ★ Water, 90°C
- ➤ Phenol solution (5% by mass), 23°C
- ✓ Urea solution (32.5% 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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