

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® 70G33L NC010 is a 33% glass fiber reinforced polyamide 66 resin for injection molding.

### Product information

Part Marking Code ISO designation>PA66-GF33<	
ISO designationISO 16396-PA66,GF33,M1GNR,S14-100Rheological propertiesdry/cond.Viscosity number $4350/*$ in <sup>3</sup> /lbISO 3Molding shrinkage, parallel $0.3/-$ %ISO 294Molding shrinkage, normal $1.1/-$ %ISO 294Typical mechanical propertiesdry/cond.Tensile modulus $1.45E6/1.16E6$ psiISOTensile stress at break, 5mm/min29000/20300 psiISOTensile strain at break, 5mm/min $29000/20300$ psiISOTensile strength $29000/20300$ psiISOTensile strength $3.5/5$ %ISOFlexural modulus $1.31E6/870000$ psiSOCompressive strength $34800/-$ psiISOTensile creep modulus, 1h $*/1.16E6$ psiISOTensile creep modulus, 1000h $*/798000$ psiISOCharpy impact strength, 73°F $40.4/47.6$ ftlb/in <sup>2</sup> ISOCharpy notched impact strength, 73°F $5.71/7.14$ ftlb/in <sup>2</sup> ISOCharpy notched impact strength, -22°F $4.76/4.76$ ftlb/in <sup>2</sup> ISOCharpy notched impact strength, -37°F $5.71/7.14$ ftlb/in <sup>2</sup> ISOCharpy notched impact strength, -22°F $4.76/4.76$ ftlb/in <sup>2</sup> ISOCharpy notched impact strength, -22°F $4.76/4.76$ ftlb/in <sup>2</sup> ISOIzod notched impact strength, -22°F $4.7$	SO 1043
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	O 180/1A
	O 180/1U
Izod impact strength, -22°F 33.3/33.3 ftlb/in <sup>2</sup> ISC	D 180/1U
Hardness, Rockwell, M-scale 101/- ISC	O 2039-2
Poisson's ratio 0.34/0.34	
Abrasion resistance 10/* mm <sup>3</sup> I	SO 4649

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NYLON RESIN

Thermal properties	dry/cond.		
Melting temperature, 18°F/min	504/*	°F	ISO 11357-1/-3
Glass transition temperature, 18°F/min	176/68	°F	ISO 11357-1/-3
Temperature of deflection under load, 260 psi	486/*	°F	ISO 75-1/-2
Temperature of deflection under load, 65 psi	502/*	°F	ISO 75-1/-2
Coeff. of linear therm. expansion, parallel, -40-23°C	0.133/*	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion	0.10/*	E-4/°F	ISO 11359-1/-2
(CLTE), parallel			
Coeff. of linear therm. expansion, parallel, 55-160°C	0.0722/*	E-4/°F	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal, -40-23°C	0.361/*	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE),	0.461/*	E-4/°F	ISO 11359-1/-2
normal			
Coeff. of linear therm. expansion, normal, 55-160°C	0.778/*	E-4/°F	ISO 11359-1/-2
Thermal conductivity of melt	0.22	W/(m K)	ISO 22007-2
Specific heat capacity of melt	2210	J/(kg K)	ISO 22007-4
Specific heat capacity solid	1330 <sup>[C]</sup>	J/(kg K)	ISO 22007-4
RTI, electrical, 30mil	266	°F	UL 746B
RTI, electrical, 60mil	266	°F	UL 746B
RTI, electrical, 120mil	266	°F	UL 746B
RTI, impact, 30mil	248	°F	UL 746B
RTI, impact, 60mil	248	°F	UL 746B
RTI, impact, 120mil	248	°F	UL 746B
RTI, strength, 30mil	266	°F	UL 746B
RTI, strength, 60mil	266/*	°F	UL 746B
RTI, strength, 120mil	266	°F	UL 746B
[C]: Calculated			
Flammability	dry/cond.		
Burning Behav. at 60mil nom. thickn.	HB/*	class	IEC 60695-11-10
Thickness tested	0.0591/*	in	IEC 60695-11-10
UL recognition	yes/*		UL 94
Burning Behav. at thickness h	HB/*	class	IEC 60695-11-10
Thickness tested	0.0280/*	in	IEC 60695-11-10
UL recognition	yes/*		UL 94
Oxygen index	24/*	%	ISO 4589-1/-2
FMVSS Class	SE/B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	1.1	in/min	ISO 3795 (FMVSS 302)
Electrical properties	dry/cond.		
Relative permittivity, 100Hz	4.2/-		IEC 62631-2-1
Relative permittivity, 1MHz	4/-		IEC 62631-2-1
Dissipation factor, 100Hz	100/-	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	150/-	E-4	IEC 62631-2-1
Volume resistivity	1E13/-	Ohm.m	IEC 62631-3-1
Comparative tracking index	600/-		IEC 60112
Electric Strength, Short Time, 1mm	940/-	V/mil	IEC 60243-1

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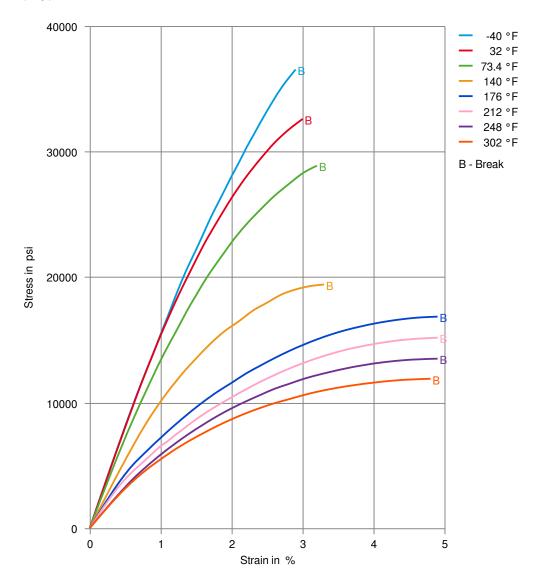


## NYLON RESIN

Physical/Other properties Humidity absorption, 80mil Water absorption, 80mil Water absorption, Immersion 24h Density [1]: 2mm thickness	dry/cond. 1.8/* 5.7/* 1.2 <sup>[1]</sup> /* 0.0502/-	% S	im. to ISO 62 im. to ISO 62 im. to ISO 62 ISO 1183
VDA Properties Emission of organic compounds Odor test Fogging, F-value (refraction) Fogging, G-value (condensate)	dry/cond. 6 4.5 95/* 0.3/*	μgC/g class % mg	VDA 277 VDA 270 ISO 6452 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. mold temperature Max. mold temperature Hold pressure range Hold pressure time Ejection temperature	yes 176 2 - 4 ≤0.2 572 554 581 ≤0.2 203 149 248 7250 - 14500 0.0762 428	h % °F °F m/s °F °F °F psi s/mil	
Characteristics Processing	Injection Molding		
Delivery form Additives	Pellets Release agent		
Automotive			
OEM Hyundai Stellantis - Chrysler Stellantis - Chrysler	STANDARD MS211-37 Type E MS.50017 / CPN-1853 MS.50017 / CPN-3811	ADDITIONAL INFORMATION Natural Natural	

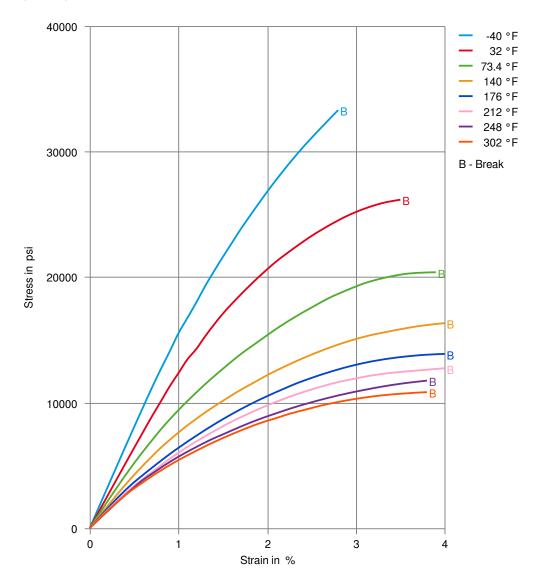


### Stress-strain (dry)



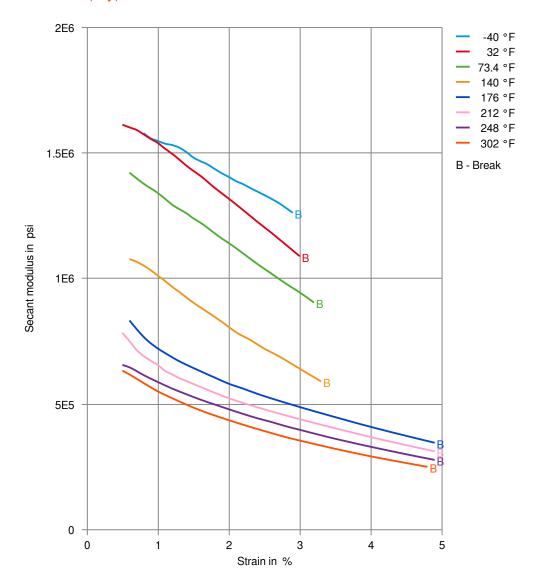


### Stress-strain (cond.)



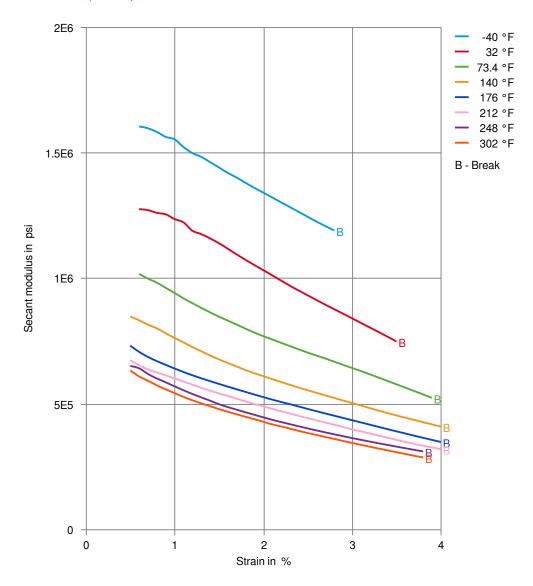


## Secant modulus-strain (dry)



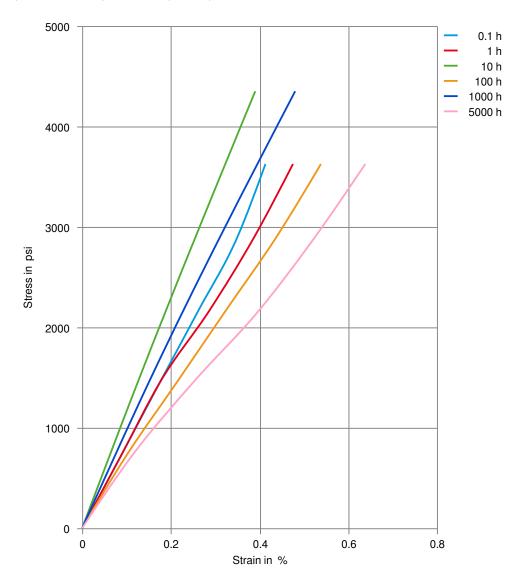


## Secant modulus-strain (cond.)



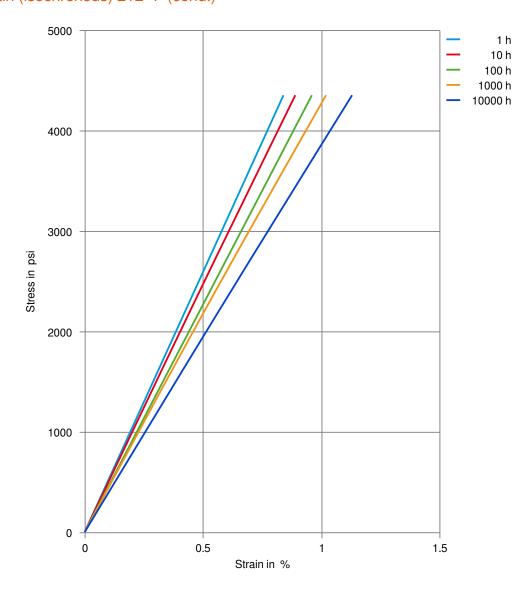


## Stress-strain (isochronous) 73.4°F (cond.)



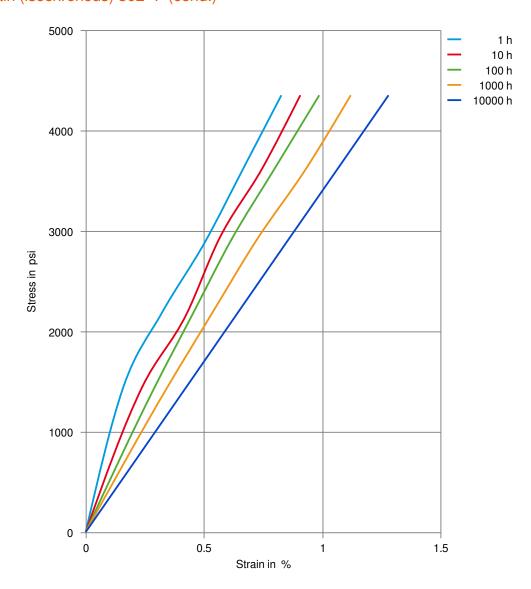


## Stress-strain (isochronous) 212°F (cond.)



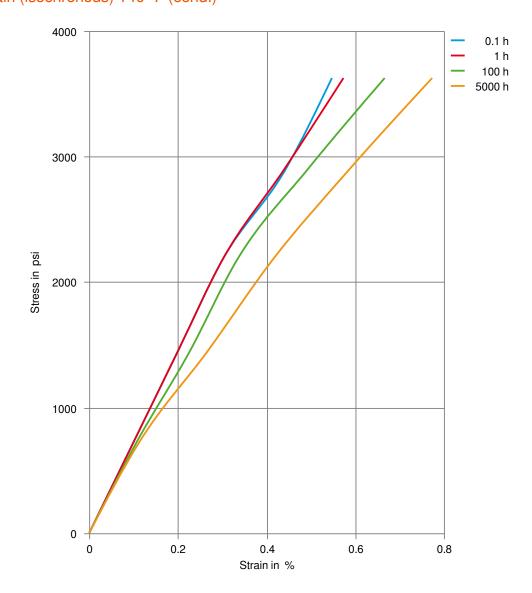


## Stress-strain (isochronous) 302°F (cond.)





## Stress-strain (isochronous) 140°F (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
- X 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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## NYLON RESIN

- 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

#### 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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#### Revised: 2024-09-04 Source: Celanese Materials Database

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