DuPont™ Zytel® 70G33L NC010

NYLON RESIN

Product Information

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, DuPont recommends, 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 moulding.

General information	Value	Unit	Test Standard	
Resin Identification	PA66-GF33	-	-	
Part Marking Code	>PA66-GF33<	-	ISO 11469	
Rheological properties	**dry / cond**	**Unit**	**Test Standard**	
Viscosity number	145 / *	cm^3/g	ISO 307, 1157, 1628	
Moulding shrinkage, parallel	0.3 / *	%	ISO 294-4, 2577	
Moulding shrinkage, normal	1.1 / *	%	ISO 294-4, 2577	
Mechanical properties	**dry / cond**	**Unit**	**Test Standard**	
Tensile Modulus	10500 / 8000	MPa	ISO 527-1/-2	
Stress at break	200 / 140	MPa	ISO 527-1/-2	
Strain at break	3.5 / 5	%	ISO 527-1/-2	
Flexural Modulus	9300 / 6210	MPa	ISO 178	
Flexural Strength	290 / 200	MPa	ISO 178	
Tensile creep modulus			ISO 899-1	
1h	* / 8000	MPa		
1000h	* / 5500	MPa		
Charpy impact strength			ISO 179/1eU	
23°C	85 / 100	kJ/m^2		
-30°C	70 / 75	kJ/m^2		
Charpy notched impact strength			ISO 179/1eA	
23°C	13 / 17	kJ/m^2		
-30°C	10 / 10	kJ/m^2		
-40°C	10 / 10	kJ/m^2		
Izod notched impact strength			ISO 180/1A	
23°C	12 / 15	kJ/m^2		
-30°C	10 / 10	kJ/m^2		
-40°C	10 / 10	kJ/m^2		
Izod impact strength			ISO 180/1U	
23°C	80 / 90	kJ/m^2		
-30°C	70 / 70	kJ/m^2		
Thermal properties	**dry / cond**	**Unit**	**Test Standard**	
Melting temperature, 10°C/min	262 / *	°C	ISO 11357-1/-3	
Glass transition temperature, 10°C/min	80 / -	°C	ISO 11357-1/-2	
Temp. of deflection under load			ISO 75-1/-2	
1.8 MPa	252 / *	°C		
0.45 MPa	261 / *	°C		
Coeff. of linear therm. expansion, parallel	18 / *	E-6/K	ISO 11359-1/-2	
Coeff. of linear therm. expansion, normal	83 / *	E-6/K	ISO 11359-1/-2	
Thermal conductivity of melt	0.22	W/(m K)	-	
Spec. heat capacity solid	1330	J/(kg K)	-	C

To find out more, visit DuPont Performance Polymers or contact nearest DuPont location.

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Spec. heat capacity of melt	2210	J/(kg K)	-
RTI, electrical, 0.8mm	130 / *	°C	UL 746B
RTI, impact, 0.8mm	120	°C	UL 746B
RTI, strength, 0.8mm	130	°C	UL 746B

C: Calculated

Flammability	dry / cond	Unit	Test Standard
Burning Behav. at thickness h	HB / *	class	IEC 60695-11-10
Thickness tested	0.7 / *	mm	IEC 60695-11-10
Oxygen index	24 / *	%	ISO 4589-1/-2
Electrical properties	**dry / cond**	**Unit**	**Test Standard**
Relative permittivity			IEC 60250
100Hz	4.2 / -	-	
1MHz	4 / -	-	
Dissipation factor			IEC 60250
100Hz	100 / -	E-4	
1MHz	150 / -	E-4	
Volume resistivity	1E13 / -	Ohm*m	IEC 60093
Comparative tracking index	600 / -	-	IEC 60112
Other properties	**dry / cond**	**Unit**	**Test Standard**
Humidity absorption, 2mm	1.8 / *	%	Sim. to ISO 62
Water absorption, 2mm	5.7 / *	%	Sim. to ISO 62
Density	1390 / -	kg/m³	ISO 1183
Water Absorption, Immersion 24h	1.2 / *	%	ASTM D 570
VDA Properties	**Value**	**Unit**	**Test Standard**
Burning rate, Thickness 1 mm	28[1]	mm/min	ISO 3795 (FMVSS 302)

1: SE/B

Characteristics			
Processing	• Injection Moulding		
Delivery form	• Pellets		
Additives	• Lubricants	• Release agent	
Regional Availability	• North America • Europe	• Asia Pacific • South and Central America	• Near East/Africa • Global

Processing Texts

Injection molding

PREPROCESSING

Drying recommended = Yes, if moisture content of resin exceeds recommended level
Drying temperature = 80°C
Drying time, dehumidified dryer = 2-4 h
Processing moisture content = <0.2 %

PROCESSING

Melt temperature optimum = 295°C
Melt temperature range = 285-305°C
Mould temperature optimum = 100°C
Mould temperature range = 70-120°C
Maximum Screw tangential Speed : 0.15 m/s
Flow front speed : 150 mm/s
Hold pressure optimum : 85 MPa
Hold pressure range : 50-100 MPa
Back pressure : low
Hold pressure time : 2.5 s/mm
Maximum hold-up time : 15 min

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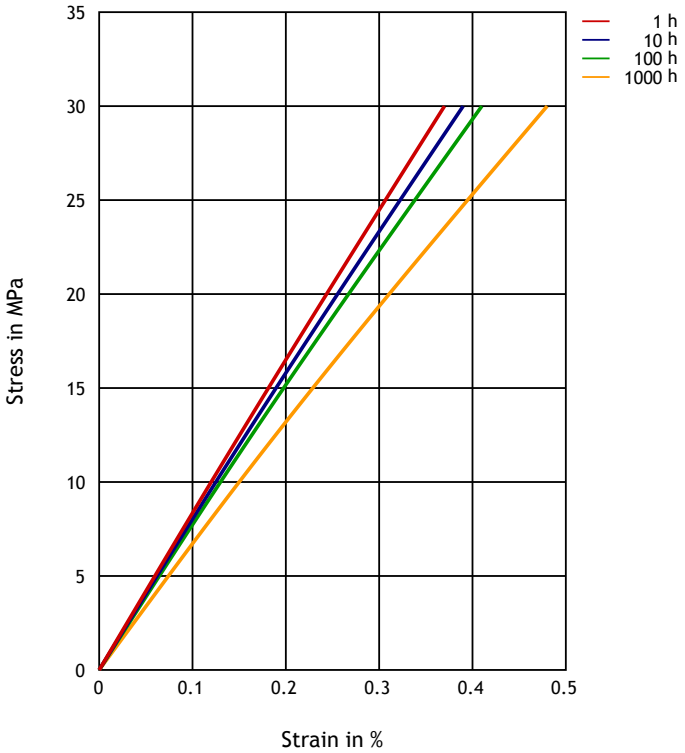
Diagrams

Stress-strain (isochronous) 23°C(cond.)



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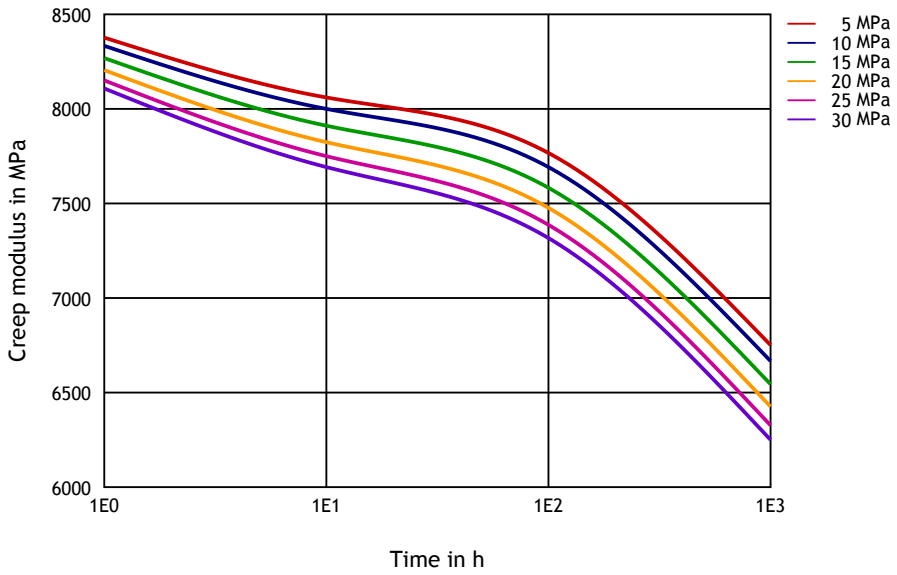
Creep modulus-time 23°C(cond.)



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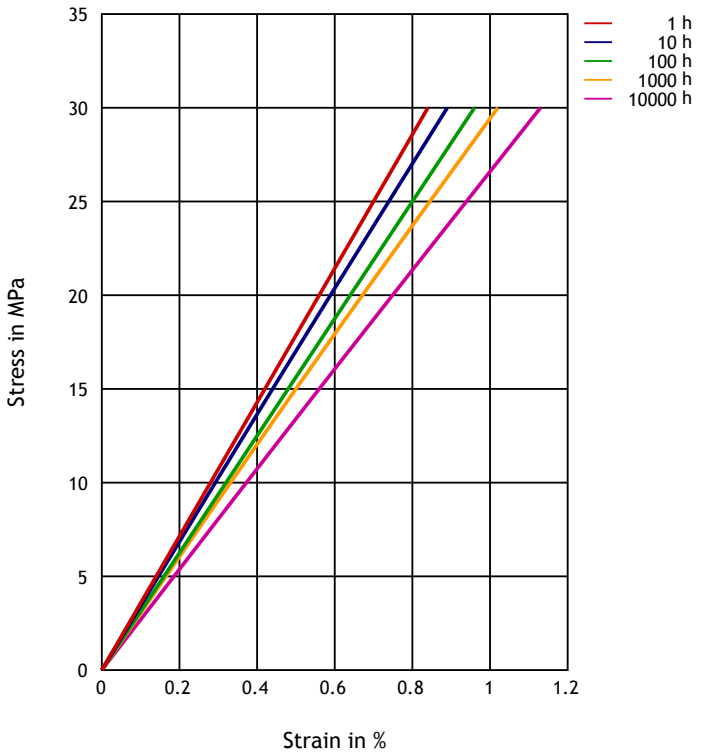
Stress-strain (isochronous) 100°C(cond.)



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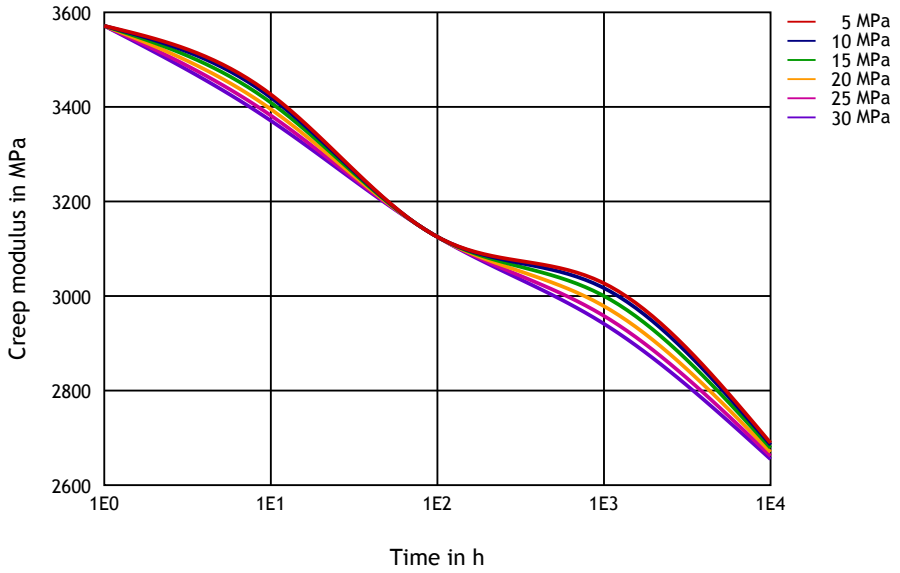
Creep modulus-time 100°C(cond.)



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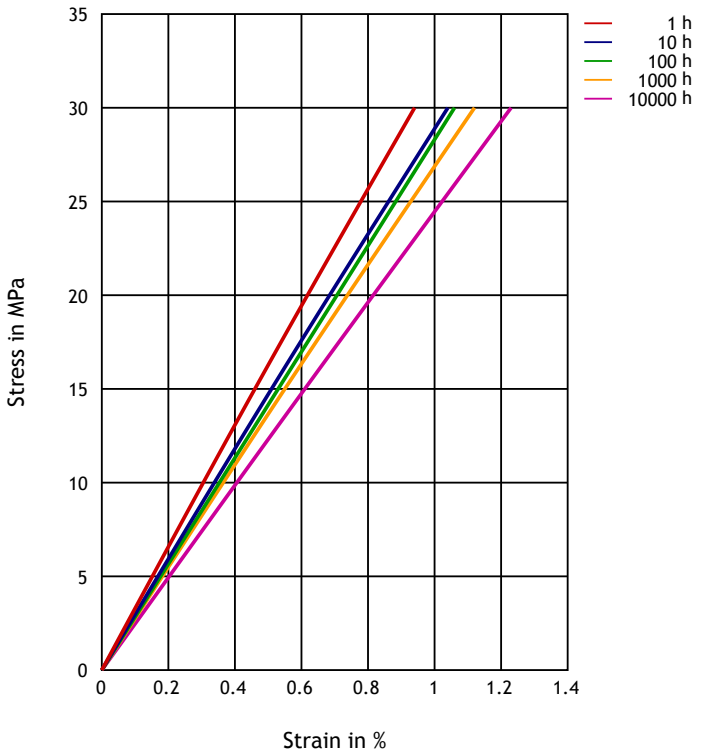
Stress-strain (isochronous) 150°C(cond.)



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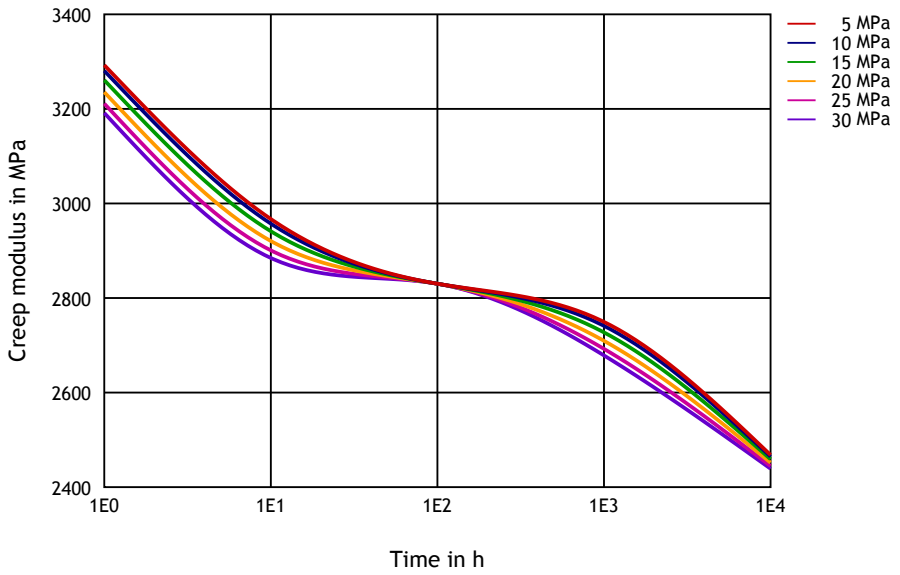
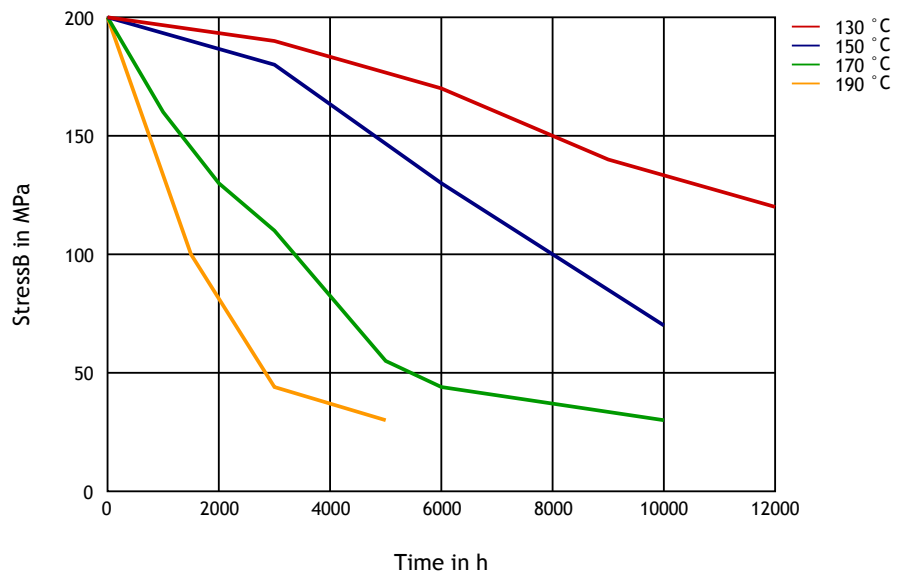
Creep modulus-time 150°C(cond.)



LTHA-Stress at Break 4mm(dry)



Chemical Media Resistance

Acids

✓ Acetic Acid (5% by mass) (23°C)

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- ✓ 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)

Standard Fuels

- ✓ ISO 1817 Liquid 1 (60°C)
- ✓ ISO 1817 Liquid 2 (60°C)
- ✓ ISO 1817 Liquid 3 (60°C)
- ✓ ISO 1817 Liquid 4 (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

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- ✓ 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)
- ✓ 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).

Contact DuPont for Material Safety Data Sheet, general guides and/or additional information about ventilation, handling, purging, drying, etc. ISO Mechanical properties measured at 4.0mm (Hytrel® measured at 2 mm), IEC Electrical properties measured at 2.0mm, all ASTM properties measured at 3.2mm, and test temperatures are 23°C unless otherwise stated.

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