DuPont™ Zytel® 70G13L 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® 70G13L is a 13% glass fiber reinforced polyamide 66 resin for injection molding.

General information	Value	Unit	Test Standard
Resin Identification	PA66-GF13	-	ISO 1043
Part Marking Code	PA66-GF13	-	ISO 11469
Rheological properties	**dry / cond**	**Unit**	**Test Standard**
Molding shrinkage, parallel	0.7 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	1.2 / -	%	ISO 294-4, 2577
Mechanical properties (TPE)	**dry / cond**	**Unit**	**Test Standard**
Abrasion resistance	10 / *	mm^3	ISO 4649
Mechanical properties	**dry / cond**	**Unit**	**Test Standard**
Tensile Modulus	5500 / 3500	MPa	ISO 527-1/-2
Stress at break	120 / 75	MPa	ISO 527-1/-2
Strain at break	3 / 13	%	ISO 527-1/-2
Flexural Modulus	4800 / 2900	MPa	ISO 178
Flexural Strength	190 / 100	MPa	ISO 178
Tensile creep modulus			ISO 899-1
1h	* / 3300	MPa	
1000h	* / 2200	MPa	
Charpy impact strength			ISO 179/1eU
73°F	40 / 70	kJ/m^2	
-22°F	40 / 30	kJ/m^2	
Charpy notched impact strength			ISO 179/1eA
73°F	5 / 6	kJ/m^2	
-22°F	4.5 / 4	kJ/m^2	
-40°F	4.5 / 4	kJ/m^2	
Izod notched impact strength			ISO 180/1A
73°F	4.5 / 4	kJ/m^2	
-22°F	4.5 / 3	kJ/m^2	
-40°F	4.5 / 3	kJ/m^2	
Izod impact strength			ISO 180/1U
73°F	40 / 55	kJ/m^2	
-22°F	35 / 28	kJ/m^2	
Thermal properties	**dry / cond**	**Unit**	**Test Standard**
Melting temperature, 18°F/min	262 / *	°C	ISO 11357-1/-3
Glass transition temperature, 18°F/min	80 / -	°C	ISO 11357-1/-2
Temp. of deflection under load			ISO 75-1/-2
260 psi	238 / *	°C	
65 psi	258 / *	°C	
Vicat softening temperature, 90°F/h, 11 lbf	205 / *	°C	ISO 306
Coeff. of linear therm. expansion, parallel	40 / *	E-6/K	ISO 11359-1/-2

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

North America **Asia Pacific** **Europe/Middle East/Africa**

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Coeff. of linear therm. expansion			ISO 11359-1/-2
normal	93 / *	E-6/K	
Normal, -40-23°C	77 / *	E-6/K	
Normal, 55-160°C	149 / *	E-6/K	
Parallel, -40-23°C	42 / *	E-6/K	
Parallel, 55-160°C	26 / *	E-6/K	
RTI, electrical			UL 746B
30mil	125 / *	°C	
60mil	125 / *	°C	
120mil	125	°C	
RTI, impact			UL 746B
30mil	120	°C	
60mil	120 / *	°C	
120mil	120	°C	
RTI, strength			UL 746B
30mil	125	°C	
60mil	125 / *	°C	
120mil	125	°C	
Flammability	**dry / cond**	**Unit**	**Test Standard**
Burning Behav. at 60mil nom. thickn.	HB / *	class	IEC 60695-11-10
Thickness tested	1.5 / *	mm	IEC 60695-11-10
UL recognition	yes / *	-	UL 94
Burning Behav. at thickness h	HB / *	class	IEC 60695-11-10
Thickness tested	0.71 / *	mm	IEC 60695-11-10
UL recognition	yes / *	-	UL 94
Oxygen index	24 / *	%	ISO 4589-1/-2
Glow Wire Flammability Index			IEC 60695-2-12
30mil	650 / -	°C	
60mil	650 / -	°C	
120mil	800 / -	°C	
Glow Wire Ignition Temperature, 30mil	675 / -	°C	IEC 60695-2-13
FMVSS Class	B	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	27	mm/min	ISO 3795 (FMVSS 302)
Electrical properties	**dry / cond**	**Unit**	**Test Standard**
Relative permittivity			IEC 62631-2-1
100Hz	3.9 / -	-	
1MHz	3.2 / -	-	
Dissipation factor			IEC 62631-2-1
100Hz	130 / -	E-4	
1MHz	150 / -	E-4	
Volume resistivity	>1E13 / -	Ohm*m	IEC 62631-3-1
Surface resistivity	* / 1E15	Ohm	IEC 62631-3-2
Electric strength	25 / -	kV/mm	IEC 60243-1
Electric Strength, Short Time, 2mm	25 / -	kV/mm	IEC 60243-1
Other properties	**dry / cond**	**Unit**	**Test Standard**
Humidity absorption, 80mil	2.2 / *	%	Sim. to ISO 62
Water absorption, 80mil	7.6 / *	%	Sim. to ISO 62
Density	1230 / -	kg/m³	ISO 1183
Water Absorption, Immersion 24h	1.7 / *	%	Sim. to ISO 62
VDA Properties	**Value**	**Unit**	**Test Standard**
Emission of organic compounds	6	µgC/g	VDA 277
Injection	**dry / cond**	**Unit**	**Test Standard**
Drying Recommended	yes	-	-
Drying Temperature	≥80	°C	-
Drying Time, Dehumidified Dryer	2 - 4	h	-
Processing Moisture Content	≤0.2	%	-

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Melt Temperature Optimum	295	°C	-
Min. melt temperature	285	°C	-
Max. melt temperature	305	°C	-
Max. screw tangential speed	0.2 / *	m/s	-
Mold Temperature Optimum	100	°C	-
Min. mold temperature	70	°C	-
Max. mold temperature	120	°C	-
Hold pressure range	50 - 100	MPa	-
Hold pressure time	3	s/mm	-
Ejection temperature	210	°C	-

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

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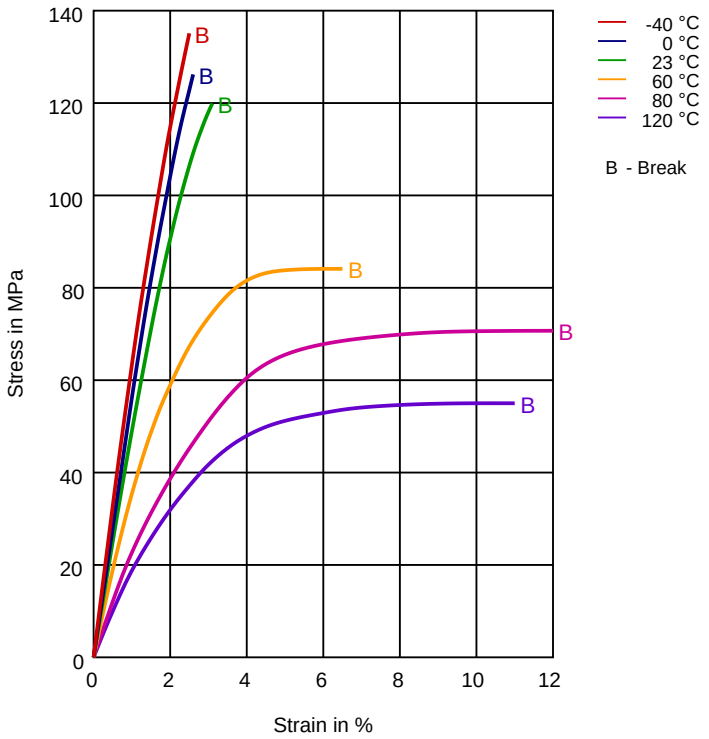
Diagrams

Stress-strain (dry)



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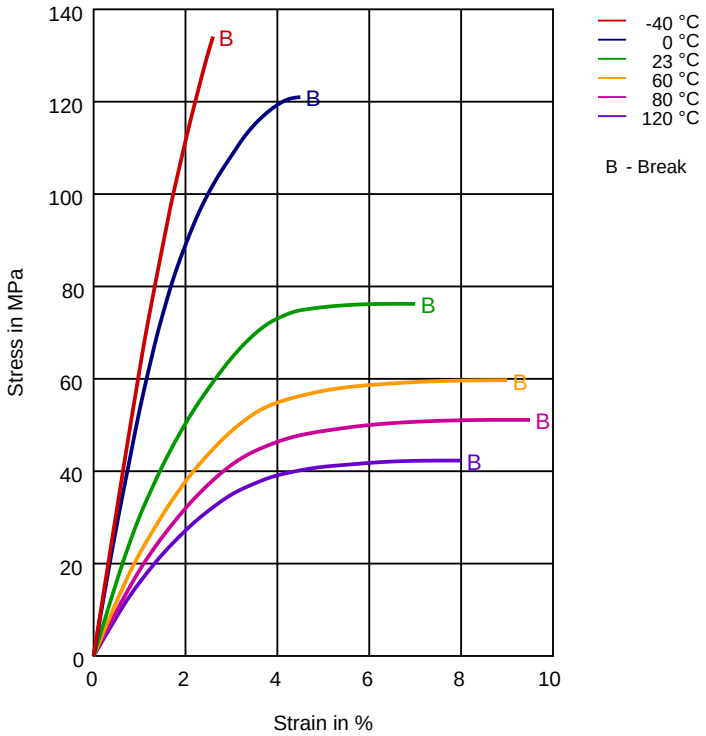
Stress-strain (cond.)



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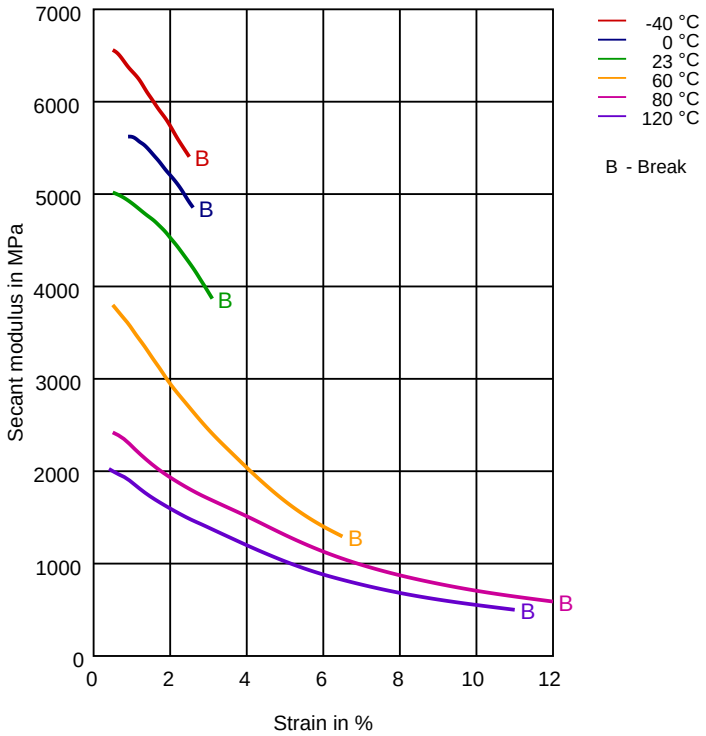
Secant modulus-strain (dry)



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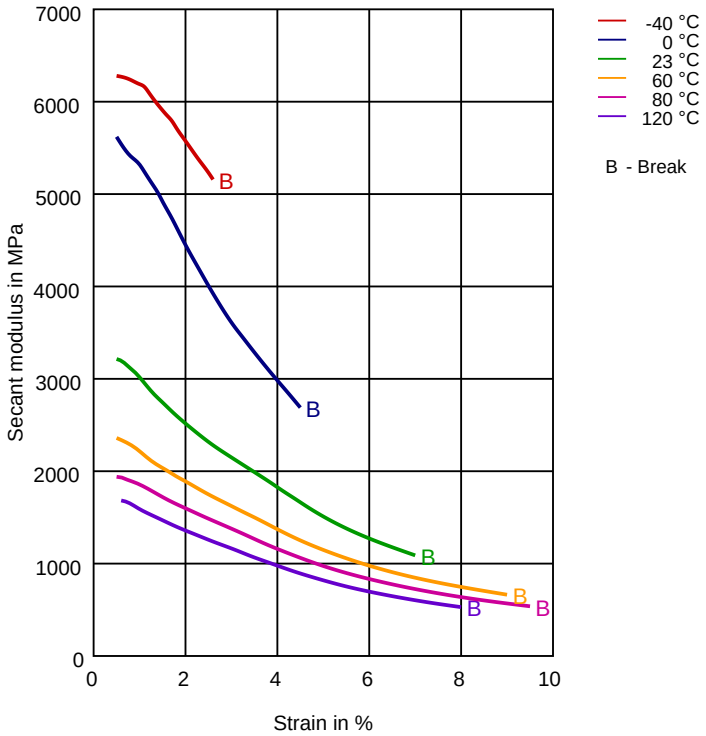
Secant modulus-strain (cond.)



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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)

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)

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✓	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)
✓	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 160 mil (Hytrel® measured at 80 mil), IEC Electrical properties measured at 80 mil, all ASTM properties measured at 120 mil, and test temperatures are 73°F unless otherwise stated.

The information set forth herein is furnished free of charge and is based on technical data that DuPont believes to be reliable and falls within the normal range of properties. It is intended for use by persons having technical skill, at their own discretion and risk. This data should not be used to establish specification limits nor used alone as the basis of design. Handling precaution information is given with the understanding that those using it will satisfy themselves that their particular conditions of use present no health or safety hazards. Since conditions of product use and disposal are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information. As with any product, evaluation under end-use conditions prior to specification is essential. Nothing herein is to be taken as a license to operate or a recommendation to infringe on patents. Caution: Do not use in medical applications involving permanent implantation in the human body. For other medical applications, discuss with your DuPont customer representative and read Medical Caution H-50103-5.

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