

# DuPont™ Zytel® 80G14A NC010A

## 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® 80G14A NC010A is a 14% glass fiber reinforced, toughened, high flow polyamide 66 resin. It offers outstanding performance in injection molding applications.**

General information	Value	Unit	Test Standard
Resin Identification	PA66-IGF14	-	ISO 1043
Part Marking Code	PA66-IGF14	-	ISO 11469
Rheological properties	dry / cond	Unit	Test Standard
Molding shrinkage, parallel	0.7 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	0.8 / -	%	ISO 294-4, 2577
Mechanical properties	dry / cond	Unit	Test Standard
Tensile Modulus	4800 / 3400	MPa	ISO 527-1/-2
Stress at break	108 / 66	MPa	ISO 527-1/-2
Strain at break	3.8 / 10	%	ISO 527-1/-2
Flexural Modulus	4400 / -	MPa	ISO 178
Tensile creep modulus			ISO 899-1
1h	* / 3100	MPa	
1000h	* / 2500	MPa	
Charpy impact strength			ISO 179/1eU
73°F	70 / 76	kJ/m <sup>2</sup>	
-22°F	90 / 71	kJ/m <sup>2</sup>	
Charpy notched impact strength			ISO 179/1eA
73°F	13 / 17	kJ/m <sup>2</sup>	
-22°F	10 / 7	kJ/m <sup>2</sup>	
-40°F	- / 6	kJ/m <sup>2</sup>	
Izod notched impact strength			ISO 180/1A
73°F	13 / -	kJ/m <sup>2</sup>	
-40°F	6 / -	kJ/m <sup>2</sup>	
Thermal properties	dry / cond	Unit	Test Standard
Melting temperature, 18°F/min	263 / *	°C	ISO 11357-1/-3
Temp. of deflection under load			ISO 75-1/-2
260 psi	240 / *	°C	
65 psi	258 / *	°C	
Vicat softening temperature, 90°F/h, 11 lbf	215 / *	°C	ISO 306
Coeff. of linear therm. expansion, parallel	40 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	120 / *	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.19	W/(m K)	-
Spec. heat capacity of melt	2350	J/(kg K)	-
Eff. thermal diffusivity	8.09E-8	m <sup>2</sup> /s	-
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
Burning Behav. at thickness h	HB / *	class	IEC 60695-11-10
Thickness tested	0.75 / *	mm	IEC 60695-11-10

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Oxygen index	21 / *	%	ISO 4589-1/-2	DS
FMVSS Class	B	-	ISO 3795 (FMVSS 302)	
Burning rate, Thickness 1 mm	44	mm/min	ISO 3795 (FMVSS 302)	DS

DS: Derived from similar grade

Electrical properties	dry / cond	Unit	Test Standard
Relative permittivity			IEC 60250
100Hz	3.8 / 7.3	-	
1MHz	3.5 / 3.9	-	
Dissipation factor			IEC 60250
100Hz	270 / 180	E-4	
1MHz	580 / 580	E-4	
Volume resistivity	>1E13 / 1E10	Ohm*m	IEC 60093
Surface resistivity	* / 1E14	Ohm	IEC 60093
Electric strength	36 / 36.5	kV/mm	IEC 60243-1
Comparative tracking index	600 / -	-	IEC 60112

Other properties	dry / cond	Unit	Test Standard
Humidity absorption, 80mil	1.8 / *	%	Sim. to ISO 62
Water absorption, 80mil	6.2 / *	%	Sim. to ISO 62
Density	1190 / -	kg/m <sup>3</sup>	ISO 1183

VDA Properties	Value	Unit	Test Standard
Emission of organic compounds	3.9	µgC/g	VDA 277
Odor test	4.5	class	VDA 270

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	%	-
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	80	°C	-
Min. mold temperature	50	°C	-
Max. mold temperature	100	°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	• Release agent
Regional Availability	• North America      • Asia Pacific      • Near East/Africa • Europe                • South and Central America      • Global

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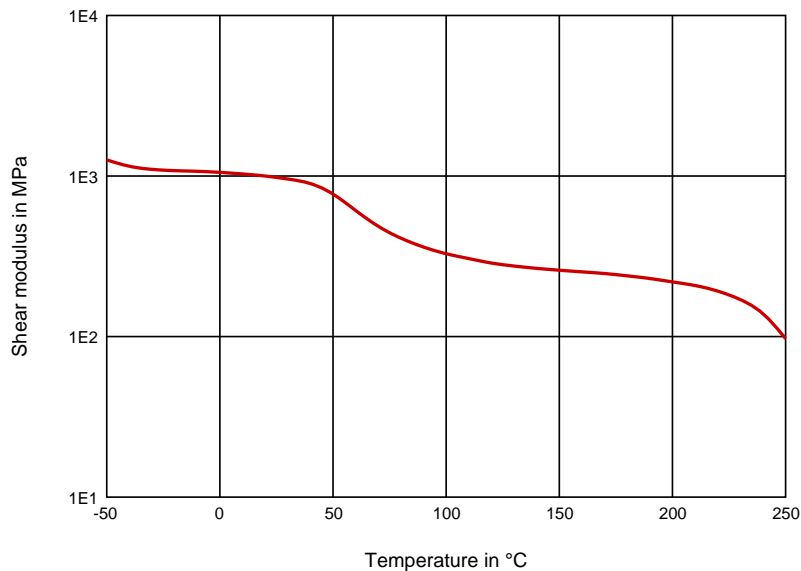


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## NYLON RESIN

Diagrams

Dynamic Shear modulus-temperature (dry)



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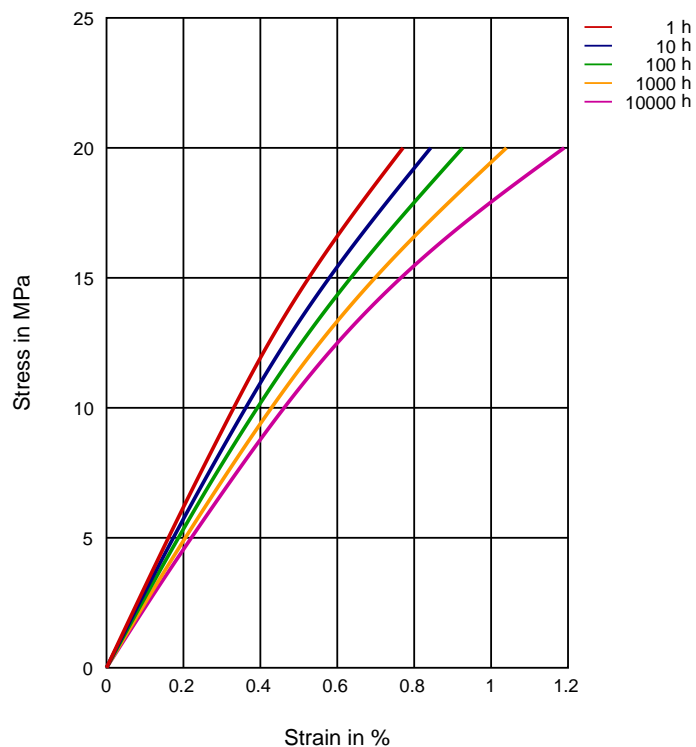
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## NYLON RESIN

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



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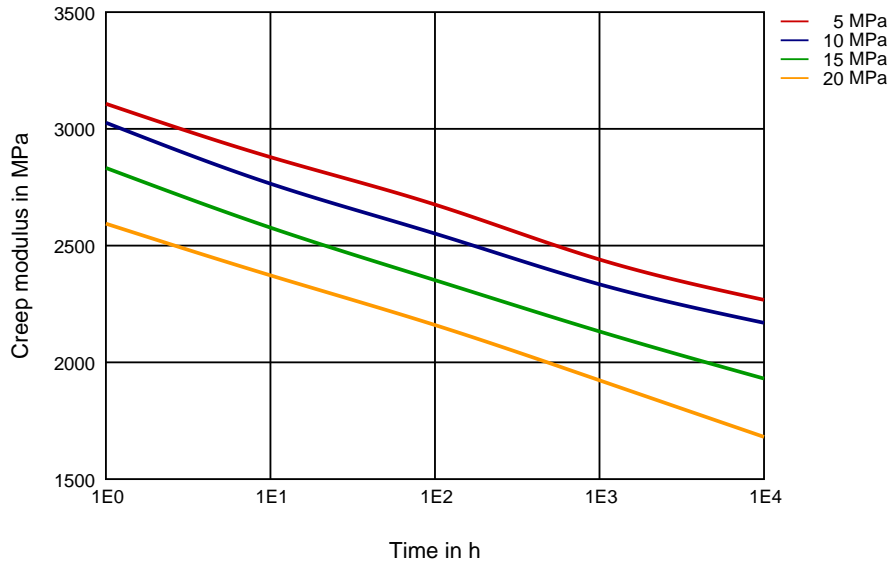
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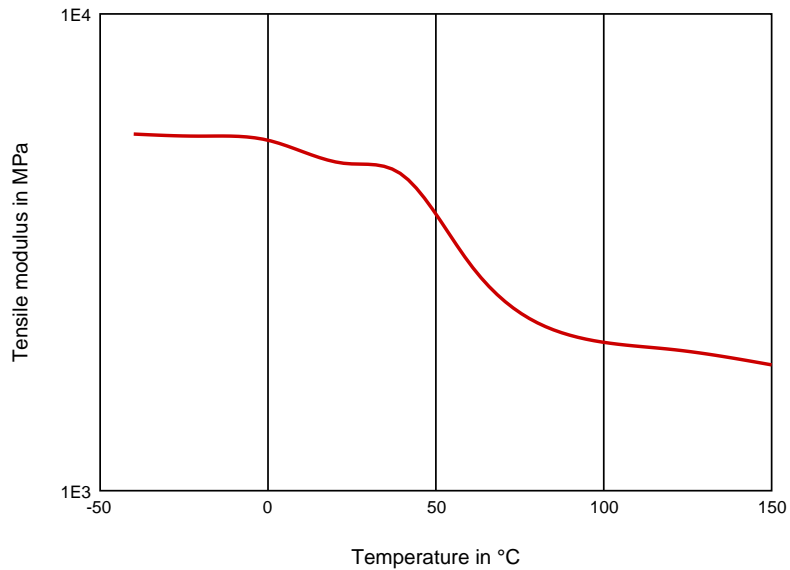
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## NYLON RESIN

Creep modulus-time 23 °C (cond.)



Tensile modulus-temperature (dry)



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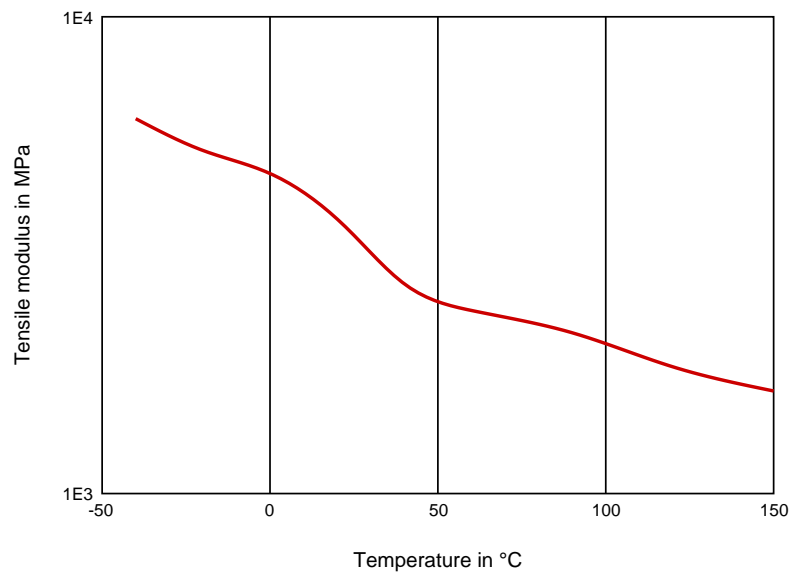
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## NYLON RESIN

Tensile modulus-temperature (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.

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