Celanese
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Zytel® 80G14A NC010A

NYLON RESIN

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

Product information

Resin Identification	PA66-IGF14	ISO 1043
Part Marking Code	>PA66-IGF14<	ISO 11469
ISO designation	ISO 16396-PA66-I,GF14,M1CGR,S14-050	

Rheological properties

	dry/cond.		
Moulding shrinkage, parallel	0.4 / -	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.8 / -	%	ISO 294-4, 2577

Typical mechanical properties

	dry/cond.		
Tensile modulus	4800 / 3400	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	108 / 66	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	3.8 / 10	%	ISO 527-1/-2
Flexural modulus	4400 / -	MPa	ISO 178
Tensile creep modulus, 1h	* / 3100	MPa	ISO 899-1
Tensile creep modulus, 1000h	* / 2500	MPa	ISO 899-1
Charpy impact strength, 23°C	70 / 76	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	90 / 71	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	13 / 17	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	10 / 7	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40°C	- / 6	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C	13 / -	kJ/m²	ISO 180/1A
Izod notched impact strength, -40°C	6.0 / -	kJ/m²	ISO 180/1A
Poisson's ratio	0.36 / 0.37		

Thermal properties

	dry/cond.		
Melting temperature, 10°C/min	263 / *	°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	240 / *	°C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	258 / *	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N	215 / *	°C	ISO 306

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Coefficient of linear thermal expansion (CLTE), parallel	40 / *	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	120 / *	E-6/K	ISO 11359-1/-2
Thermal conductivity of melt	0.19	W/(m K)	ISO 22007-2
Effective thermal diffusivity, flow	8.09E-8	m^2/s	ISO 22007-4
Specific heat capacity of melt	2350	J/(kg K)	ISO 22007-4
Specific heat capacity solid	1240	J/(kg K)	ISO 22007-4

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
Burning Behav. at thickness h	HB / *	class	IEC 60695-11-10
Thickness tested	0.75 / *	mm	IEC 60695-11-10
Oxygen index	21 / *[DS]	%	ISO 4589-1/-2
FMVSS Class	B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	18	mm/min	ISO 3795 (FMVSS 302)

[DS]: Derived from similar grade

Electrical properties

	dry/cond.		
Relative permittivity, 100Hz	3.8 / 7.3		IEC 62631-2-1
Relative permittivity, 1MHz	3.5 / 3.9		IEC 62631-2-1
Dissipation factor, 100Hz	270 / 180	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	580 / 580	E-4	IEC 62631-2-1
Volume resistivity	>1E13 / 1E10	Ohm.m	IEC 62631-3-1
Surface resistivity	* / 1E14	Ohm	IEC 62631-3-2
Electric strength	36 / 36.5	kV/mm	IEC 60243-1
Comparative tracking index	600 / -		IEC 60112

Physical/Other properties

	dry/cond.		
Humidity absorption, 2mm	1.8 / *	%	Sim. to ISO 62
Water absorption, 2mm	6.2 / *	%	Sim. to ISO 62
Density	1190 / -	kg/m^3	ISO 1183

VDA Properties

Emission of organic compounds	3.9	µgC/g	VDA 277
Odour	4.5	class	VDA 270

Injection

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
Screw tangential speed	≤0.2	m/s

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Mold Temperature Optimum	80	°C
Min. mould temperature	50	°C
Max. mould temperature	100	°C
Hold pressure range	50 - 100	MPa
Hold pressure time	3	s/mm
Ejection temperature	210	°C

Characteristics

Processing	Injection Moulding
Delivery form	Pellets
Additives	Release agent
Special characteristics	High impact or impact modified

Automotive

OEM	STANDARD	ADDITIONAL INFORMATION
BMW	GS93016-PA66-GF15	(Impact Resistant)

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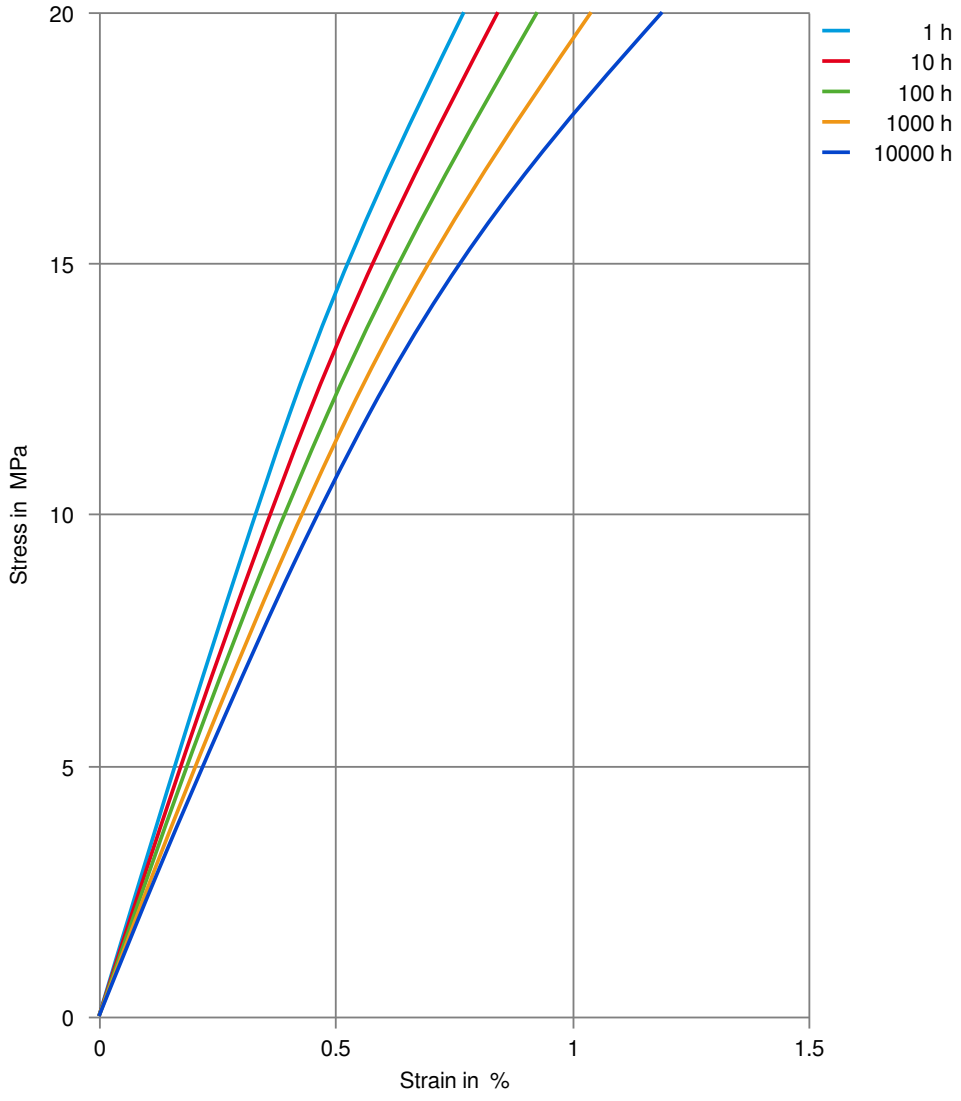
Stress-strain (isochronous) 23 °C (cond.)



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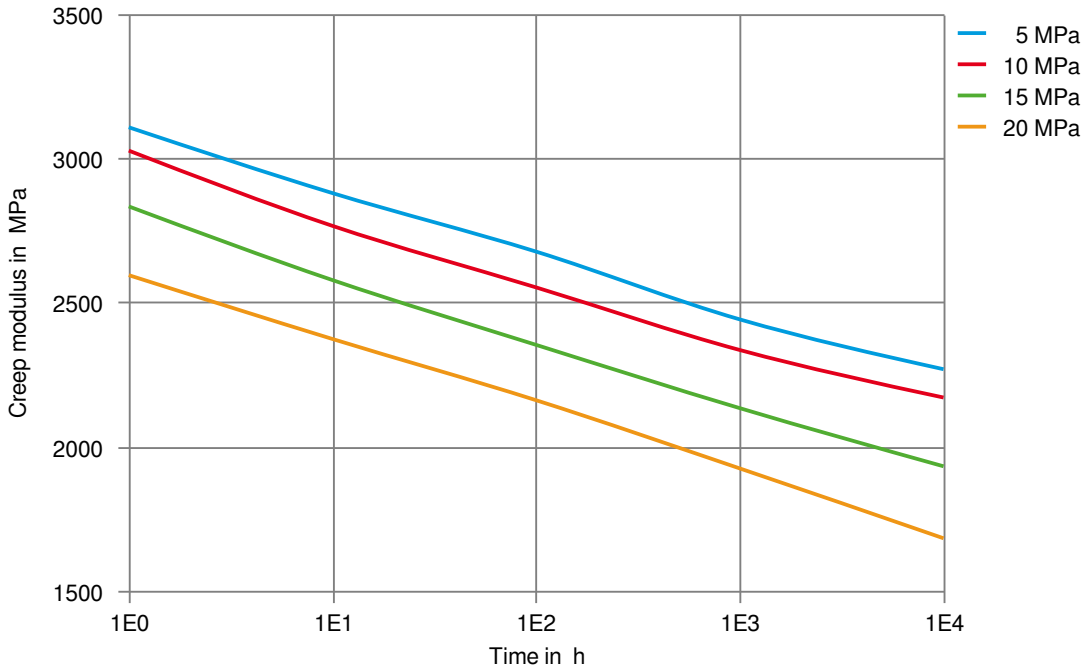
NYLON RESIN

Creep modulus-time 23 °C (cond.)



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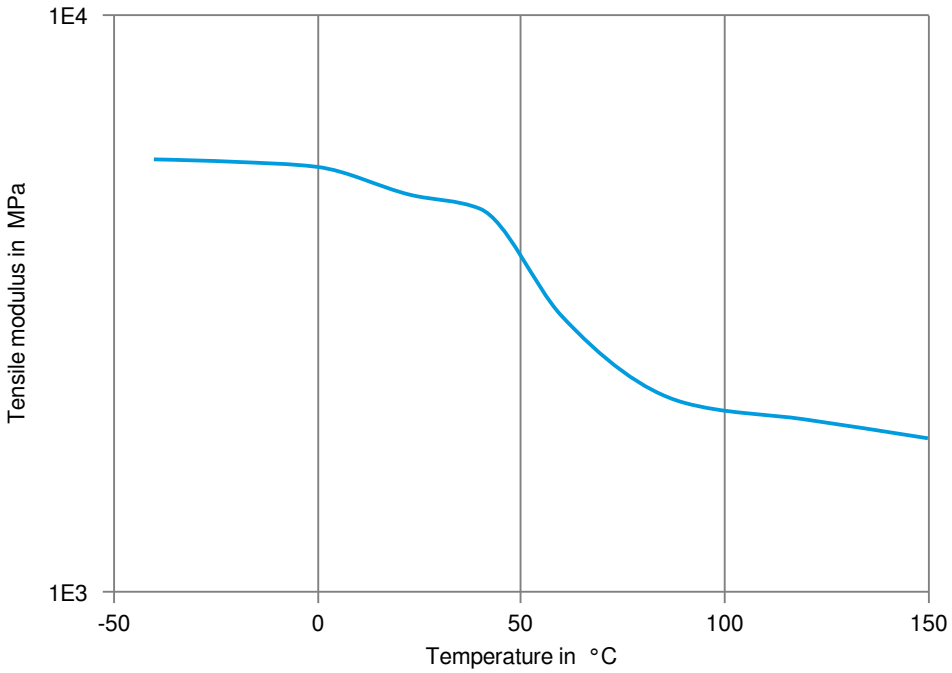
Tensile modulus-temperature (dry)



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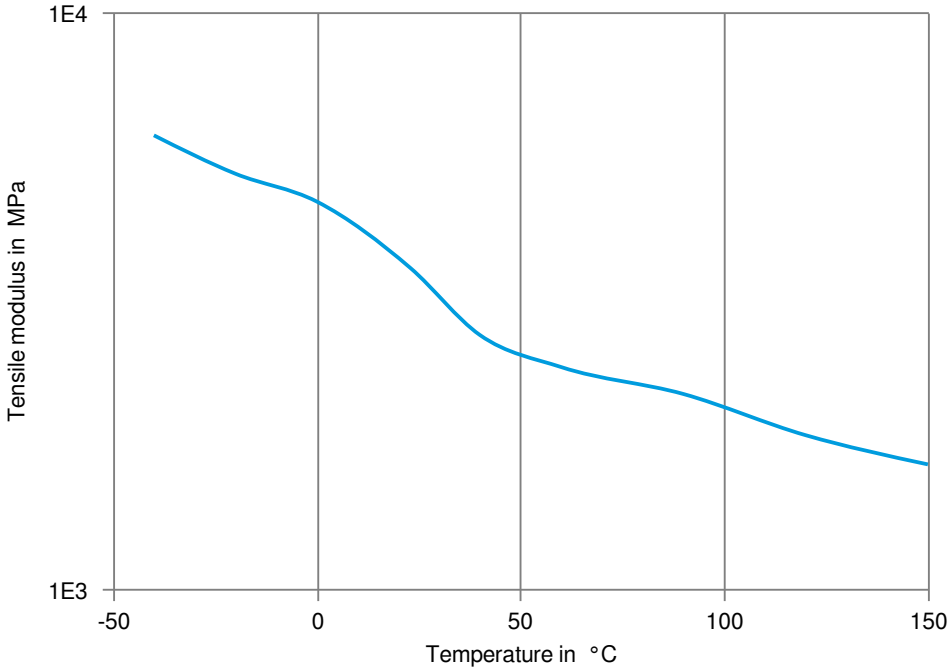
NYLON RESIN

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
- ✔ 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
- ✘ 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).