

ISO 1043

Zytel® 70G33L NC010

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.

PA66-GF33

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

Product information Resin Identification

Resin Identification PA66-GF3	3	ISO 1043
Part Marking Code >PA66-GF33<		ISO 11469
ISO designation ISO 16396-PA6	66,GF33,M1GNR,S14-100	
Rheological properties dry/cond.		
Viscosity number 4350/*	in ³ /lb	ISO 307, 1628
Molding shrinkage, parallel 0.3/-	%	ISO 294-4, 2577
Molding shrinkage, normal 1.1/-	%	ISO 294-4, 2577
Typical mechanical properties dry/cond.		
Tensile modulus 1.45E6/1.16E	6 psi	ISO 527-1/-2
Tensile stress at break, 5mm/min 29000/20300) psi	ISO 527-1/-2
Tensile strain at break, 5mm/min 3.5/5	%	ISO 527-1/-2
Flexural modulus 1.31E6/87000	00 psi	ISO 178
Flexural strength 42100/29000) psi	ISO 178
Compressive strength 34800/-	psi	ISO 604
Tensile creep modulus, 1h */1.16E	6 psi	ISO 899-1
Tensile creep modulus, 1000h */79800	00 psi	ISO 899-1
Charpy impact strength, 73°F 40.4/47.6	ftlb/in ²	ISO 179/1eU
Charpy impact strength, -22°F 33.3/35.7	ftlb/in ²	ISO 179/1eU
Charpy notched impact strength, 73°F 6.18/8.09	ftlb/in ²	ISO 179/1eA
Charpy notched impact strength, -22°F 4.76/4.76	ftlb/in ²	ISO 179/1eA
Charpy notched impact strength, -40°F 4.76/4.76	ftlb/in ²	ISO 179/1eA
Izod notched impact strength, 73°F 5.71/7.14	ftlb/in ²	ISO 180/1A
Izod notched impact strength, -22°F 4.76/4.76	ftlb/in ²	ISO 180/1A
Izod notched impact strength, -40°F 4.76/4.76	ftlb/in ²	ISO 180/1A
Izod impact strength, 73°F 38.1/42.8	ftlb/in ²	ISO 180/1U
Izod impact strength, -22°F 33.3/33.3	ftlb/in ²	ISO 180/1U
Hardness, Rockwell, M-scale 101/-		ISO 2039-2
Poisson's ratio 0.34/0.34		
Abrasion resistance 10/*	mm ³	ISO 4649

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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 ^[C]	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/*	111	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/*	111	UL 94
Oxygen index	24/*	%	ISO 4589-1/-2
FMVSS Class	SE/B	70	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	1.1	in/min	ISO 3795 (FMVSS 302)
Burning rate, Thickness Trinin	1.1		100 0733 (1 W/V 00 002)
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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P	hysical/Other	r propert	ties	dry/cond.
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Humidity absorption, 80mil	1.8/*	%	Sim. to ISO 62
Water absorption, 80mil	5.7/*	%	Sim. to ISO 62
Water absorption, Immersion 24h	1.2 ^[1] /*	%	Sim. to ISO 62
Density	0.0502/-	lb/in³	ISO 1183

[1]: 2mm thickness

VDA Properties dry/cond.

Emission of organic compounds	6	μgC/g	VDA 277
Odor test	4.5	class	VDA 270
Fogging, F-value (refraction)	95/*	%	ISO 6452
Fogging, G-value (condensate)	0.3/*	mg	ISO 6452

Injection

Drying Recommended	yes	
Drying Temperature	176	۰F
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.2	%
Melt Temperature Optimum	572	°F
Min. melt temperature	554	°F
Max. melt temperature	581	°F
Screw tangential speed	≤0.2	m/s
Mold Temperature Optimum	203	°F
Min. mold temperature	149	°F
Max. mold temperature	248	°F
Hold pressure range	7250 - 14500	psi
Hold pressure time	0.0762	s/mil
Ejection temperature	428	۰F

Characteristics

Processing Injection Molding

Delivery form Pellets

Additives Release agent

Automotive

OEM STANDARD ADDITIONAL INFORMATION

Hyundai MS211-37 Type E

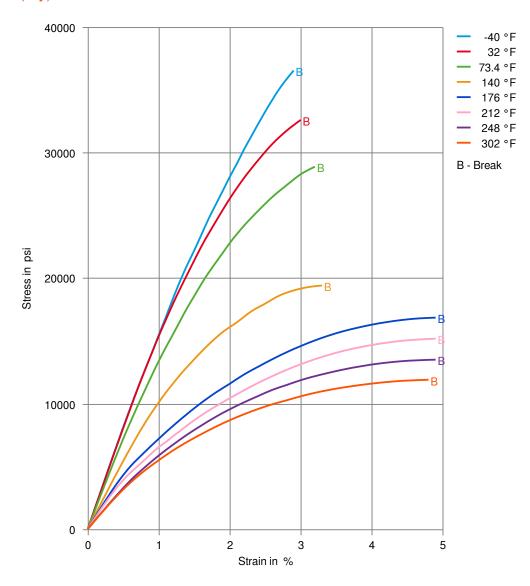
Stellantis - ChryslerMS.50017 / CPN-1853NaturalStellantis - ChryslerMS.50017 / CPN-3811Natural

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Stress-strain (dry)

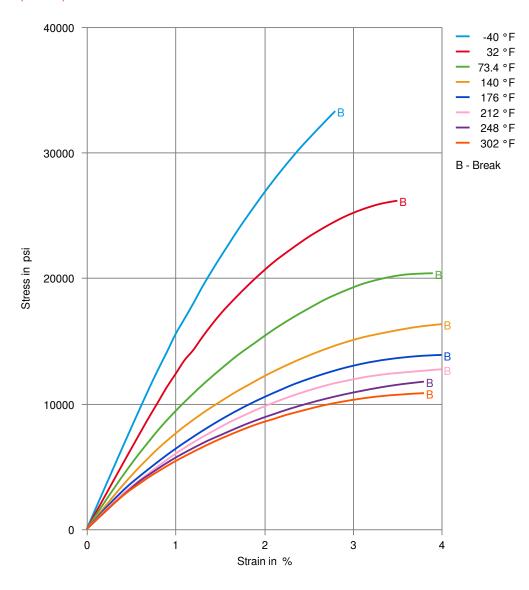


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NYLON RESIN

Stress-strain (cond.)

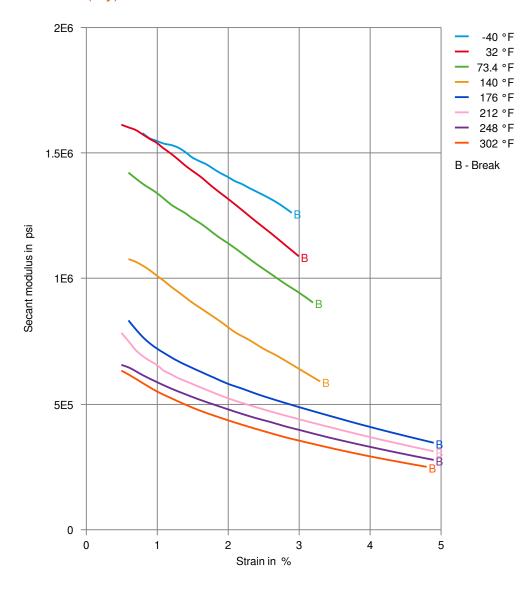


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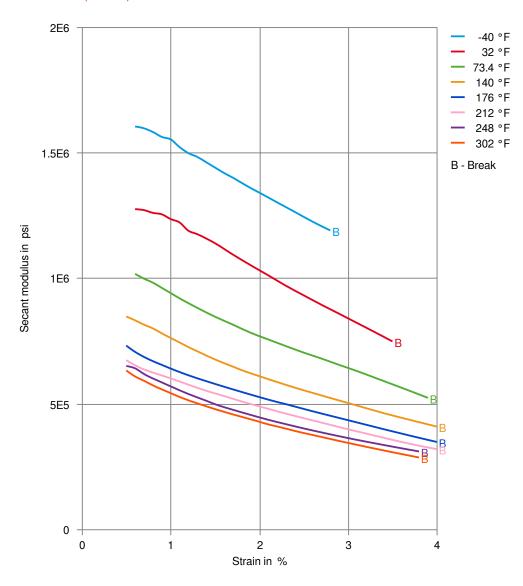
Secant modulus-strain (dry)



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Secant modulus-strain (cond.)

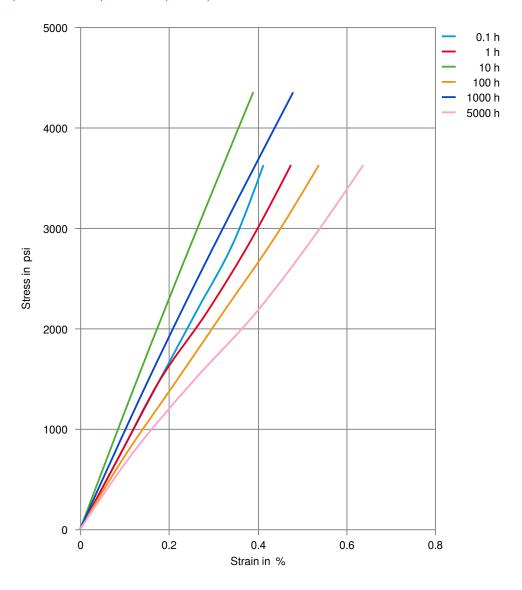


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Stress-strain (isochronous) 73.4°F (cond.)

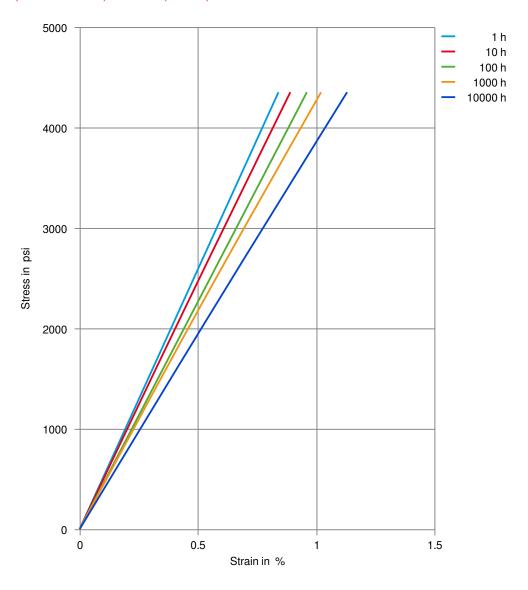


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Stress-strain (isochronous) 212°F (cond.)

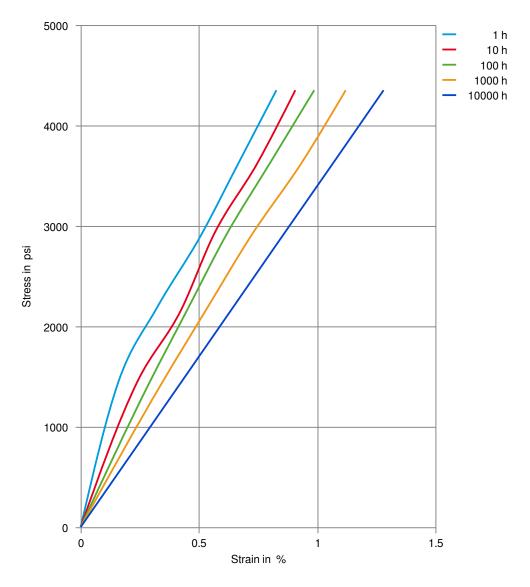


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Stress-strain (isochronous) 302°F (cond.)

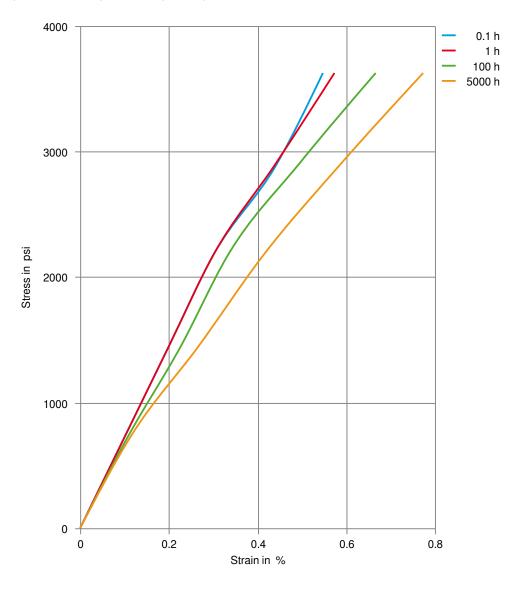


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Stress-strain (isochronous) 140°F (cond.)



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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
- X 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

- X 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
- X Zinc Chloride solution (50% by mass), 23°C

Other

- ✓ Ethyl Acetate, 23°C
- X 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
- X 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

NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colorants or other additives may cause significant variations in data values. Properties of molded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design, processing conditions and environmental exposure. Other than those products expressly identified as medical grade (including by MT® product designation or otherwise), Celanese's products are not intended for use in medical or dental implants. Regardless of any such product designation, any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use. To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication. Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommend that users seek and ad

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