Celanese
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Zytel® 7301 NC010

NYLON RESIN

Zytel® 7301 NC010 is an Unreinforced Polyamide 6

Product information

Resin Identification	PA6	ISO 1043
Part Marking Code	>PA6<	ISO 11469
ISO designation	ISO 16396-PA6,,M1G1N,S14-030	

Rheological properties

	dry/cond.		
Viscosity number	150[1]/*	cm^3/g	ISO 307, 1628

[1]: Sulfuric acid 96%

Typical mechanical properties

	dry/cond.		
Tensile modulus	2900 / 1500	MPa	ISO 527-1/-2
Tensile stress at yield, 50mm/min	80 / -	MPa	ISO 527-1/-2
Tensile strain at yield, 50mm/min	4.5 / -	%	ISO 527-1/-2
Nominal strain at break	25 / -	%	ISO 527-1/-2
Tensile strain at break, 50mm/min	50 / -	%	ISO 527-1/-2
Flexural modulus	2300 / -	MPa	ISO 178
Charpy impact strength, 23°C	N / N	kJ/m^2	ISO 179/1eU
Charpy impact strength, -30°C	N / -	kJ/m^2	ISO 179/1eU
Charpy impact strength, -40°C	N / -	kJ/m^2	ISO 179/1eU
Charpy notched impact strength, 23°C	6 / -	kJ/m^2	ISO 179/1eA
Izod notched impact strength, 23°C	6 / -	kJ/m^2	ISO 180/1A
Izod notched impact strength, -40°C	6.0 / -	kJ/m^2	ISO 180/1A
Izod impact strength, 23°C	- / N	kJ/m^2	ISO 180/1U
Hardness, Rockwell, R-scale	119 / -		ISO 2039-2
Ball indentation hardness, H 961/30	170 / -	MPa	ISO 2039-1
Poisson's ratio	0.37 / 0.43		
Abrasion resistance	4.5 / *	mm^3	ISO 4649

Tribological properties

	dry/cond.		
Coefficient of static friction, against steel	- / 0.22		ISO 8295
Coefficient of sliding friction, 1h against steel	- / 0.26		ASTM 1894

Thermal properties

	dry/cond.		
Melting temperature, 10°C/min	221 / *	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	60 / 15	°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	55 / *	°C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	160 / *	°C	ISO 75-1/-2
Coefficient of linear thermal expansion (CLTE), parallel	70 / *	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	100 / *	E-6/K	ISO 11359-1/-2
Thermal conductivity, flow	0.24	W/(m K)	ISO 22007-2
Specific heat capacity solid	1680	J/(kg K)	ISO 22007-4

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Flammability

	dry/cond.		
Glow Wire Flammability Index, 1.0mm	800 / -	°C	IEC 60695-2-12
Glow Wire Flammability Index, 3.0mm	850 / -	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 0.75mm	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 0.4mm	725 / -	°C	IEC 60695-2-12
Glow Wire Ignition Temperature, 1.0mm	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 1.5mm	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 2.0mm	725 / -	°C	IEC 60695-2-13
Glow Wire Ignition Temperature, 3.0mm	725 / -	°C	IEC 60695-2-13
Glow Wire Temperature, No Flame, 0.75mm	700 / -	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 1mm	700 / -	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 1.5mm	700 / -	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 2mm	700 / -	°C	IEC 60335-1
Glow Wire Temperature, No Flame, 3mm	700 / -	°C	IEC 60335-1
FMVSS Class	B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<80	mm/min	ISO 3795 (FMVSS 302)

Electrical properties

	dry/cond.		
Relative permittivity, 1MHz	3.5 / 7		IEC 62631-2-1
Volume resistivity	1E13 / 1E10	Ohm.m	IEC 62631-3-1
Surface resistivity	* / 1E10	Ohm	IEC 62631-3-2
Comparative tracking index	600 / 600		IEC 60112

Physical/Other properties

	dry/cond.		
Humidity absorption, 2mm	3 / *	%	Sim. to ISO 62
Water absorption, 2mm	9.5 / *	%	Sim. to ISO 62
Density	1130 / -	kg/m³	ISO 1183

Film Properties

	dry/cond.		
Stress at yield, parallel	32 / *	MPa	ISO 527-3
Stress at yield, normal	31 / *	MPa	ISO 527-3
Strain at yield, parallel	18 / *	%	ISO 527-3
Strain at yield, normal	18 / *	%	ISO 527-3
Maximum stress, parallel	90 / *	MPa	ISO 527-3
Maximum stress, normal	80 / *	MPa	ISO 527-3
Maximum strain, parallel	350 / *	%	ISO 527-3
Maximum strain, normal	400 / *	%	ISO 527-3
Gloss, 60°	90 / *		ISO 2813
Haze	0.02 / *		ISO 14782
WVTR, 23°C/85%r.h.	15 / *	g/(m²*d)	DIS 15106-1/-2
Oxygen transmission rate, 23°C/0%r.h.	12 / *	cm³/(m²*d*bar)	DIS 15105-1/-2
Carbon Dioxide transm. rate, 23°C/0%r.h.	45 / *	cm³/(m²*d*bar)	DIS 15105-1/-2
Thickness of specimen	0.1 / *	mm	

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Injection

Drying Recommended	yes	
Drying Temperature	80	°C
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.2	%
Melt Temperature Optimum	270	°C
Min. melt temperature	260	°C
Max. melt temperature	280	°C
Screw tangential speed	≤0.2	m/s
Mold Temperature Optimum	70	°C
Min. mould temperature	50	°C
Max. mould temperature	90	°C
Hold pressure range	50 - 100	MPa
Hold pressure time	4	s/mm

Extrusion

Drying Temperature	≤80	°C
Drying Time, Dehumidified Dryer	4 - 6	h
Processing Moisture Content	≤0.05	%
Melt Temperature Optimum	235	°C
Melt Temperature Range	230 - 240	°C

Characteristics

Processing	Injection Moulding, Film Extrusion, Extrusion, Sheet Extrusion, Other Extrusion, Coatable
Delivery form	Pellets

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

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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
- ✔ 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).

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Revised: 2025-04-22 Source: Celanese Materials Database