

Zytel® FG42A NC010

NYLON RESIN

Zytel® FG42A is a high viscosity polyamide 66 for injection molding and extrusion. It has improved break resistance for thick-walled parts. It has been developed for consideration into applications such as parts for the food industry.

FOOD CONTACT

This product is manufactured according to Good Manufacturing Practice (GMP) principles and generally accepted in food contact applications in Europe and the USA when meeting applicable use conditions. For details, individual compliance statements are available from our representative.

Product information

Resin Identification	PA66	ISO 1043
Part Marking Code	>PA66<	ISO 11469
ISO designation	ISO 16396-PA66,,M1G1NR,S32-030	

Rheological properties

	dry/cond.		
Melt mass-flow rate	2.5 / *	g/10min	ISO 1133
Melt mass-flow rate, Temperature	275 / *	°C	
Melt mass-flow rate, Load	2.16 / *	kg	
Viscosity number	300 ^[1] / *	cm ³ /g	ISO 307, 1628
Moulding shrinkage, parallel	1.4 / -	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.4 / -	%	ISO 294-4, 2577

[1]: Sulfuric acid 96%

Typical mechanical properties

	dry/cond.		
Tensile modulus	3100 / 1300	MPa	ISO 527-1/-2
Tensile stress at yield, 50mm/min	83 / 55	MPa	ISO 527-1/-2
Tensile strain at yield, 50mm/min	4.4 / 27	%	ISO 527-1/-2
Nominal strain at break	>50 / >50	%	ISO 527-1/-2
Flexural modulus	2800 / 1070	MPa	ISO 178
Charpy impact strength, 23°C	N / N	kJ/m ²	ISO 179/1eU
Charpy impact strength, -30°C	N / N	kJ/m ²	ISO 179/1eU
Charpy notched impact strength, 23°C	6 / 20	kJ/m ²	ISO 179/1eA
Charpy notched impact strength, -30°C	6 / 4	kJ/m ²	ISO 179/1eA
Izod notched impact strength, 23°C	6 / 23	kJ/m ²	ISO 180/1A
Izod notched impact strength, -30°C	7.0 / 6.0	kJ/m ²	ISO 180/1A
Izod impact strength, 23°C	N / N	kJ/m ²	ISO 180/1U
Izod impact strength, -30°C	N / N	kJ/m ²	ISO 180/1U
Poisson's ratio	0.37 / 0.44		

Thermal properties

	dry/cond.		
Melting temperature, 10°C/min	262 / *	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	70 / 20	°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	70 / *	°C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	200 / *	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N	244 / *	°C	ISO 306
Coefficient of linear thermal expansion (CLTE), parallel	100 / *	E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	100 / *	E-6/K	ISO 11359-1/-2

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Thermal conductivity of melt	0.16	W/(m K)	ISO 22007-2
Specific heat capacity of melt	2790	J/(kg K)	ISO 22007-4
RTI, electrical, 0.75mm	125	°C	UL 746B
RTI, electrical, 1.5mm	125	°C	UL 746B
RTI, electrical, 3.0mm	125	°C	UL 746B
RTI, electrical, 6mm	125	°C	UL 746B
RTI, impact, 0.75mm	65	°C	UL 746B
RTI, impact, 1.5mm	75	°C	UL 746B
RTI, impact, 3.0mm	75	°C	UL 746B
RTI, impact, 6mm	75	°C	UL 746B
RTI, strength, 0.75mm	65	°C	UL 746B
RTI, strength, 1.5mm	85 / *	°C	UL 746B
RTI, strength, 3.0mm	85	°C	UL 746B
RTI, strength, 6mm	85	°C	UL 746B

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
UL recognition	yes / *		UL 94
Burning Behav. at thickness h	V-2 / *	class	IEC 60695-11-10
Thickness tested	3 / *	mm	IEC 60695-11-10
UL recognition	yes / *		UL 94
Oxygen index	28 / *	%	ISO 4589-1/-2
FMVSS Class	SE		ISO 3795 (FMVSS 302)

Electrical properties

		dry/cond.	
Relative permittivity, 100Hz	4.3 / 10		IEC 62631-2-1
Relative permittivity, 1MHz	3.6 / 4.2		IEC 62631-2-1
Dissipation factor, 100Hz	150 / 2000	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	150 / 750	E-4	IEC 62631-2-1
Volume resistivity	1E13 / 1E11	Ohm.m	IEC 62631-3-1
Electric strength	31 / -	kV/mm	IEC 60243-1

Physical/Other properties

		dry/cond.	
Humidity absorption, 2mm	2.6 / *	%	Sim. to ISO 62
Water absorption, 2mm	8.5 / *	%	Sim. to ISO 62
Density	1140 / -	kg/m ³	ISO 1183
Density of melt	1010	kg/m ³	

Injection

Drying Recommended	yes	
Drying Temperature	80	°C
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.2	%
Melt Temperature Optimum	290	°C
Min. melt temperature	280	°C
Max. melt temperature	300	°C
Screw tangential speed	≤0.4	m/s

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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
Ejection temperature	150 °C

Extrusion

Drying Temperature	80 °C
Drying Time, Dehumidified Dryer	4 - 6 h
Processing Moisture Content	≤0.05 %
Melt Temperature Optimum	285 °C
Melt Temperature Range	280 - 290 °C

Characteristics

Processing	Injection Moulding, Film Extrusion, Extrusion, Sheet Extrusion, Other Extrusion, Coatable, Casting
Delivery form	Pellets
Additives	Release agent

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

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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).