

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® 70G30HSLR ECO-R BK099 is a 30% glass fibre reinforced, heat stabilised, hydrolysis resistant polyamide 66 resin for injection molding. It has same performance and processing properties as Zytel® 70G30HSLR BK099.

Zytel® 70G30HSLR ECO-R BK099 belongs to the Zytel® ECO-R family. The products of this family contain polyamide derived from certified* post-industrial recyclate streams. This results in reduced lifecycle greenhouse gas emissions and lower fossil resource use.

*certified circular according to ISCC PLUS mass balance approach.

Rheological properties	dry/cond.		
Viscosity number	150 ^[1] /*	cm ³ /g	ISO 307, 1628
Moulding shrinkage, parallel	0.3/-	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.0/-	%	ISO 294-4, 2577
Melt viscosity, @ 1000 sec-1, 280°C	190/*	Pa.s	ISO 11443
[1]: acid sulphuric 96%			
Typical mechanical properties	dry/cond.		
Tensile modulus	10000/7000	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	200/130	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	3/5	%	ISO 527-1/-2
Flexural modulus	9000/6500 ^{[DS}	^{S]} MPa	ISO 178
Flexural strength	280/200 ^[DS]	MPa	ISO 178
Flexural stress at 3.5%	270/170	MPa	ISO 178
Charpy impact strength, 23°C	70/80	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	70/70 ^[DS]	kJ/m²	ISO 179/1eU
Charpy impact strength, -40°C	65/-	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	12/15	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	9/9 ^[DS]	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40 °C	9/9	kJ/m²	ISO 179/1eA

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Izod notched impact strength, 23°C Izod notched impact strength, -30°C Izod notched impact strength, -40°C Hardness, Rockwell, M-scale Hardness, Rockwell, R-scale Ball indentation hardness, H 961/30 Poisson's ratio Multiaxial Impact, Total Energy, 4.5m/s, 2mm [DS]: Derived from similar grade	10/12 10.0/- 10.0/- 104/88 124/117 270/185 0.34/0.35 5/-	kJ/m² kJ/m² kJ/m² MPa	ISO 180/1A ISO 180/1A ISO 180/1A ISO 2039-2 ISO 2039-1 ISO 6603-2
Thermal properties	dry/cond.		
Melting temperature, 10 ° C/min Glass transition temperature, 10 ° C/min Temperature of deflection under load, 1.8 MPa Temperature of deflection under load, 0.45 MPa Coeff. of linear therm. expansion, parallel, -40-23 ° C Coefficient of linear thermal expansion (CLTE), parallel Coeff. of linear therm. expansion, parallel, 55-160 ° C Coeff. of linear therm. expansion, normal, -40-23 ° C Coefficient of linear thermal expansion (CLTE), normal Coefficient of linear thermal expansion (CLTE), normal, 55-160 ° C Thermal conductivity, flow Thermal conductivity of melt Specific heat capacity of melt	262/* 75/20 253/* 261/* 26/* 22/* 13/* 70/* 80/* 130/* 0.36 0.21 2290	°C °C °C °C E-6/K E-6/K E-6/K E-6/K E-6/K W/(m K) W/(m K)	ISO 11357-1/-3 ISO 11357-1/-3 ISO 75-1/-2 ISO 75-1/-2 ISO 11359-1/-2 ISO 11359-1/-2 ISO 11359-1/-2 ISO 11359-1/-2 ISO 11359-1/-2 ISO 11359-1/-2 ISO 22007-2 ISO 22007-2 ISO 22007-4
Flammability	dry/cond.		
Burning Behav. at 1.5mm nom. thickn. Thickness tested Burning Behav. at thickness h Thickness tested Oxygen index Glow Wire Flammability Index, 1.0mm Glow Wire Flammability Index, 2.0mm Glow Wire Flammability Index, 3.0mm Glow Wire Ignition Temperature, 1.0mm Glow Wire Ignition Temperature, 2.0mm Glow Wire Ignition Temperature, 3.0mm Glow Wire Ignition Temperature, 3.0mm Glow Wire Temperature, No Flame, 3mm FMVSS Class Burning rate, Thickness 1 mm [2]: Based on Zytel® 70G30HSLR BK099	HB/* 1.5/* HB/* 0.75/* 24/* 700/- 750/- 800/- 725/- 725/- 775/- 750/- B 37 ^[2]	class mm class mm % °C °C °C °C °C °C °C	IEC 60695-11-10 IEC 60695-11-10 IEC 60695-11-10 IEC 60695-11-10 ISO 4589-1/-2 IEC 60695-2-12 IEC 60695-2-12 IEC 60695-2-12 IEC 60695-2-13 IEC 60695-2-13 IEC 60695-2-13 IEC 60695-2-13 IEC 60695-2-13 IEC 60335-1 ISO 3795 (FMVSS 302) ISO 3795 (FMVSS 302)

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Electrical properties

dry/cond.

dry/cond.

Volume resistivity	>1E13/1E9 ^[DS] Ohm.m	IEC 62631-3-1
Surface resistivity	*/1E12 ^[DS] Ohm	IEC 62631-3-2
Electric strength	38/32 kV/mm	IEC 60243-1
Comparative tracking index	400/-	IEC 60112
[DS]: Derived from similar grade		

Physical/Other properties

Humidity absorption, 2mm	1.9/*	%	Sim. to ISO 62
Water absorption, 2mm	6/*	%	Sim. to ISO 62
Water absorption, Immersion 24h	1.3/*	%	Sim. to ISO 62
Density	1370/-	kg/m³	ISO 1183

VDA Properties

Odour	5 ^[2] class	VDA 270
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[2]: Based on Zytel® 70G30HSLR BK099

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
Mold Temperature Optimum	100	°C
Min. mould temperature	70	°C
Max. mould temperature	120	°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 Heat stabilised or stable to heat, Hydrolysis resistant

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

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- 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
- ✓ Motor oil OS206 304 Ref.Eng.Oil, ISP, 135°C
- ✓ Automatic hypoid-gear oil Shell Donax TX, 135°C
- ✓ Hydraulic oil Pentosin CHF 202, 125°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
- X 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

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Other

- ✓ Ethyl Acetate, 23°C
- X Hydrogen peroxide, 23°C
- ✓ DOT No. 4 Brake fluid, 130°C
- ✓ DOT No. 4 Brake fluid, 120°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
- ✓ Coolant Glysantin G48, 1:1 in water, 125°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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