

Zytel® 70G13HSA ECO-R 311 BLK2

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® 70G13HS1L ECO-R 311 BLK1LM incorporates 30% of post-industrial recycled content by weight in the finished product. It is a 13% glass fiber reinforced, Heat stabilized, black polyamide 66 for injection molding.

Product information

Resin Identification	PA66-GF13 (REC30)	ISO 1043
Part Marking Code	>PA66-GF13 (REC30)<	ISO 11469
ISO designation	ISO 16396-PA66,GF13 (R30),MCGHR,S14-050	

Rheological properties

	dry/cond.		
Viscosity number	134 ^{[1]/*}	cm ³ /g	ISO 307, 1628
Molding shrinkage, parallel	0.3 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	0.7 / -	%	ISO 294-4, 2577
Melt viscosity , @ 1000 sec-1, 280°C	130 ^{[2]/*}	Pa.s	ISO 11443

[1]: formic acid

[2]: measured at 0.13% moisture level

Typical mechanical properties

	dry/cond.		
Tensile modulus	6000 / -	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	100 / -	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	2 / -	%	ISO 527-1/-2
Charpy impact strength, 23°C	29 / -	kJ/m ²	ISO 179/1eU
Charpy notched impact strength, 23°C	4 / -	kJ/m ²	ISO 179/1eA

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Thermal properties

	dry/cond.	
Melting temperature, 10 °C/min	261 / *	°C
Temperature of deflection under load, 1.8 MPa	230 / *	°C

ISO 11357-1/-3
ISO 75-1/-2

Physical/Other properties

	dry/cond.	
Humidity absorption, 2mm	2.2 ^{[3]/*}	%
Water absorption, 2mm	7.6 ^{[3]/*}	%
Water absorption, Immersion 24h	1.7 ^{[3]/*}	%
Density	1230 / -	kg/m ³

Sim. to ISO 62
Sim. to ISO 62
Sim. to ISO 62
ISO 1183

[3]: derived from similar grade

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
Max. screw tangential speed	≤0.2 m/s
Mold Temperature Optimum	100 °C
Min. mold temperature	70 °C
Max. mold temperature	120 °C
Hold pressure range	50 - 100 MPa
Hold pressure time	3 s/mm
Hold Pressure Time (h is the max. wall thickness of the part in mm)	h ² +2 s
Ejection temperature	210 °C

Characteristics

Processing	Injection Molding
Special characteristics	Heat stabilized or stable to heat
Sustainability	Recycled Content

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

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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
- ✓ 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

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✗ 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).