Zytel® E41HSB 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.

Zytel® E41HSB is an unreinforced, high viscosity, heat stabilized polyamide 66 for injection molding and extrusion.

Product information

Resin Identification	PA66	ISO 1043
Part Marking Code	>PA66<	ISO 11469
ISO designation	ISO 16396-PA66,,M1G1HN,S22-030	

Rheological properties

	dry/cond.		
Viscosity number	230[1]/*	cm³/g	ISO 307, 1628
Molding shrinkage, parallel	1.3 / -	%	ISO 294-4, 2577
Molding shrinkage, normal	1.5 / -[DS]	%	ISO 294-4, 2577
Postmolding shrinkage, normal, 48h at 80 °C	-0.01 / *[DS]	%	ISO 294-4
Postmolding shrinkage, parallel, 48h at 80 °C	0.1 / *[DS]	%	ISO 294-4

[DS]: Derived from similar grade

[1]: Sulfuric acid 96%

Typical mechanical properties

	dry/cond.		
Tensile modulus	3000 / 1200	MPa	ISO 527-1/-2
Tensile stress at yield, 50mm/min	84 / 55	MPa	ISO 527-1/-2
Tensile strain at yield, 50mm/min	4 / 26	%	ISO 527-1/-2
Nominal strain at break	50 / >50	%	ISO 527-1/-2
Charpy notched impact strength, 23 °C	6 / 18	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23 °C	5 / 15	kJ/m²	ISO 180/1A

Thermal properties

	dry/cond.		
Melting temperature, 10 °C/min	263 / *	°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	75 / *	°C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	220 / *	°C	ISO 75-1/-2

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Flammability

FMVSS Class	B		ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	<80	mm/min	ISO 3795 (FMVSS 302)

Physical/Other properties

	dry/cond.		
Humidity absorption, 2mm	2.6 / *[DS]	%	Sim. to ISO 62
Density	1140 / -	kg/m³	ISO 1183

[DS]: Derived from similar grade

Injection

Drying Recommended	yes	
Drying Temperature	80	°C
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.05	%
Melt Temperature Optimum	290	°C
Min. melt temperature	280	°C
Max. melt temperature	300	°C
Max. screw tangential speed	≤0.4	m/s
Mold Temperature Optimum	70	°C
Min. mold temperature	50	°C
Max. mold temperature	90	°C
Hold pressure range	50 - 100	MPa
Hold pressure time	4	s/mm
Hold Pressure Time (h is the max. wall thickness of the part in mm)	h^2+2	s
Ejection temperature	190	°C

Extrusion

Drying Temperature	80	°C
Drying Time, Dehumidified Dryer	4 - 6	h
Processing Moisture Content	≤0.06	%
Melt Temperature Optimum	285	°C
Melt Temperature Range	275 - 290	°C

Automotive

OEM	STANDARD	ADDITIONAL INFORMATION
BMW	GS93016-PA66	(Heat Aging Resistant)
VW Group	VW 50133 PA66-1-A	

Characteristics

Processing	Injection Molding, Film Extrusion, Extrusion, Sheet Extrusion, Other Extrusion, Coating, Casting
Special characteristics	Heat stabilized or stable to heat

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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
- ✘ 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

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

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
- ✘ 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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