

# Zytel<sup>®</sup> BM73G15THS BK317 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® BM73G15THS is a 15% glass fibre reinforced, heat stabilised, lubricated, toughened polyamide 6 for blow moulding.

### **Product information**

Resin Identification Part Marking Code ISO designation	PA6-IGF15 >PA6-IGF15< ISO 16396-PA6-I	,GF15,M1CGHR,S14-050	ISO 1043 ISO 11469
Rheological properties	dry/cond.		
Moulding shrinkage, parallel	0.4 <sup>[1]</sup> /-	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.6/-	%	ISO 294-4, 2577
Melt viscosity, @ 1000 sec-1, 280°C	300/*	Pa.s	ISO 11443
[1]: Blow-molding shrinkage : Parallel 0.7% Normal 1.2%			
Typical mechanical properties	dry/cond.		
Tensile modulus	5000/2500	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	100/65	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	4.5/23	%	ISO 527-1/-2
Charpy impact strength, 23°C	80/110	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, 23°C	21/29	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30 °C	13/11	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -40°C	12/-	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C	21/28	kJ/m²	ISO 180/1A
Izod notched impact strength, -30°C	11.0/11.0	kJ/m²	ISO 180/1A
Ball indentation hardness, H 961/30	180/-	MPa	ISO 2039-1
Poisson's ratio	0.35/0.38 <sup>[A]</sup>		
[A]: Assessed			
Thermal properties	dry/cond.		
Melting temperature, 10°C/min	221/*	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	60/10	°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	190/*	°C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	215/*	°C	ISO 75-1/-2

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Flammability Oxygen index FMVSS Class Burning rate, Thickness 1 mm	dry/cond. 25 / * B <80	% mm/min	ISO 4589-1/-2 ISO 3795 (FMVSS 302) ISO 3795 (FMVSS 302)
Electrical properties Dissipation factor, 100Hz Dissipation factor, 1MHz Volume resistivity Comparative tracking index	dry/cond. 160/- 160/- 1E13/- 600/-	E-4 E-4 Ohm.m	IEC 62631-2-1 IEC 62631-2-1 IEC 62631-3-1 IEC 60112
Physical/Other properties Humidity absorption, 2mm Water absorption, 2mm Density [DS]: Derived from similar grade	dry/cond. 2.6 / * <sup>[DS]</sup> 7.5 / * <sup>[DS]</sup> 1200 / -	% % kg/m³	Sim. to ISO 62 Sim. to ISO 62 ISO 1183
Injection Drying Recommended Drying Temperature Drying Time, Dehumidified Dryer Processing Moisture Content Melt Temperature Optimum Min. melt temperature Max. melt temperature Screw tangential speed Mold Temperature Optimum Min. mould temperature Max. mould temperature Hold pressure range Hold pressure time Ejection temperature	2 - 4 ≤0.2 260 240 270 ≤0.2 80 70 90 50 - 100	% °C °C °C m/s °C °C °C MPa s/mm	
Extrusion Drying Temperature Drying Time, Dehumidified Dryer Processing Moisture Content Melt Temperature Range Blow Molding Drying Recommended Drying Temperature Drying Time, Dehumidified Dryer	80 4 - 6 ≤0.06 235 - 250 yes 100 - 110 4 - 6	% °C °C	
Processing Moisture Content Melt Temperature Optimum Melt Temperature Range Swell ratio	≤0.03 245 255 - 265 1.5	°C	

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Mold Temperature Optimum	90	°C
Mold Temperature Range	80 - 110	°C

### Characteristics

Processing	Injection Moulding, Blow Moulding
Delivery form	Pellets
Additives	Release agent
Special characteristics	Heat stabilised or stable to heat

### **Automotive**

OEM	STANDARD
Hyundai	MS211-72 Type A
VW Group	VW 50134 PA6-3-A





Viscosity-shear rate







Shearstress-shear rate







Stress-strain (dry)







Stress-strain (cond.)





## Secant modulus-strain (dry)







### Secant modulus-strain (cond.)







Tensile modulus-temperature (dry)







Tensile modulus-temperature (cond.)







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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
- 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

- ✗ 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

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#### 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
- X Zinc Chloride solution (50% by mass), 23°C

#### Other

- ✓ Ethyl Acetate, 23°C
- X 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).

X 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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