



## **NYLON RESIN**

## ISO 1043: PA6-HI

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® ST7301 BK356 is a Super Tough, heat stabilised, lubricated polyamide 6 resin for injection molding and extrusion. It offers outstanding impact resistance over a wide temperature and humidity range and high productivity.

### **Product information**

| 1 Todact information                  |                                  |         |                 |
|---------------------------------------|----------------------------------|---------|-----------------|
| Resin Identification                  | PA6-HI                           |         | ISO 1043        |
| Part Marking Code                     | >PA6-HI<                         |         | ISO 11469       |
| ISO designation                       | ISO 16396-PA6-I,,M1CG1HR,S14-020 |         |                 |
| Rheological properties                | dry/cond.                        |         |                 |
| Melt mass-flow rate                   | 6.5/*                            | g/10min | ISO 1133        |
| Melt mass-flow rate, Temperature      | 250/*                            | °C      |                 |
| Melt mass-flow rate, Load             | 2.16/*                           | kg      |                 |
| Moulding shrinkage, parallel          | 1.3/-                            | %       | ISO 294-4, 2577 |
| Moulding shrinkage, normal            | 1.3/-                            | %       | ISO 294-4, 2577 |
| Typical mechanical properties         | dry/cond.                        |         |                 |
| Tensile modulus                       | 1800/550                         | MPa     | ISO 527-1/-2    |
| Tensile stress at yield, 50mm/min     | 48/30                            | MPa     | ISO 527-1/-2    |
| Tensile strain at yield, 50mm/min     | 4/33                             | %       | ISO 527-1/-2    |
| Nominal strain at break               | 45/>50                           | %       | ISO 527-1/-2    |
| Tensile strain at break, 50mm/min     | >50/>50                          | %       | ISO 527-1/-2    |
| Flexural modulus                      | 1800/550                         | MPa     | ISO 178         |
| Charpy notched impact strength, 23°C  | 77/120                           | kJ/m²   | ISO 179/1eA     |
| Charpy notched impact strength, -30°C | 17/18                            | kJ/m²   | ISO 179/1eA     |
| Charpy notched impact strength, -40°C | 16/14                            | kJ/m²   | ISO 179/1eA     |
| Izod notched impact strength, 23°C    | 57/95                            | kJ/m²   | ISO 180/1A      |
| Izod notched impact strength, -30°C   | 16.0/15.0                        | kJ/m²   | ISO 180/1A      |
| Izod notched impact strength, -40°C   | 13.0/12.0                        | kJ/m²   | ISO 180/1A      |
| Poisson's ratio                       | 0.41/0.47                        |         |                 |

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## **NYLON RESIN**

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| Melting temperature, 10°C/min                  | 221/*     | °C | ISO 11357-1/-3 |
|--|-----------|----|----------------|
| Glass transition temperature, 10°C/min         | 60/15     | °C | ISO 11357-1/-3 |
| Temperature of deflection under load, 1.8 MPa  | 45/*      | °C | ISO 75-1/-2    |
| Temperature of deflection under load, 0.45 MPa | 88/*      | °C | ISO 75-1/-2    |
| TGA curve                                      | available |    | ISO 11359-1/-2 |

dry/cond.

## Flammability

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

## Physical/Other properties

| Humidity absorption, 2mm | 2.7/*  | %     | Sim. to ISO 62 |
|--------------------------|--------|-------|----------------|
| Density                  | 1060/- | kg/m³ | ISO 1183       |

dry/cond.

## Injection

| Drying Recommended              | yes      |      |
|---------------------------------|----------|------|
| Drying Temperature              | 80       | °C   |
| Drying Time, Dehumidified Dryer | 2 - 4    | h    |
| Processing Moisture Content     | ≤0.2     | %    |
| Melt Temperature Optimum        | 270      | °C   |
| Min. melt temperature           | 260      | °C   |
| Max. melt temperature           | 280      | °C   |
| Screw tangential speed          | ≤0.3     | m/s  |
| 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            | 140      | °C   |

### Extrusion

| Drying Temperature              | 80        | $^{\circ}\text{C}$ |
|---------------------------------|-----------|--------------------|
| Drying Time, Dehumidified Dryer | 3 - 4     | h                  |
| Processing Moisture Content     | ≤0.06     | %                  |
| Melt Temperature Optimum        | 240       | °C                 |
| Melt Temperature Range          | 235 - 250 | °C                 |

### Characteristics

Processing Injection Moulding, Film Extrusion, Extrusion, Sheet Extrusion, Other Extrusion,

Coatable, Casting

Special characteristics High impact or impact modified

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## **NYLON RESIN**

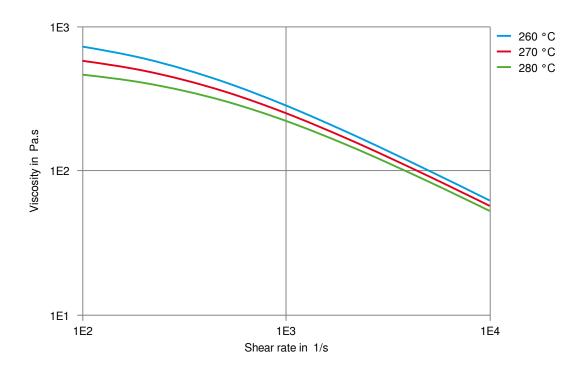
### **Automotive**

OEM STANDARD

Mercedes-Benz DBL5404.15 PA6-HI

Mercedes-Benz DBL5410.01 PA6-I

Viscosity-shear rate (measured on Zytel® ST7301 NC010)

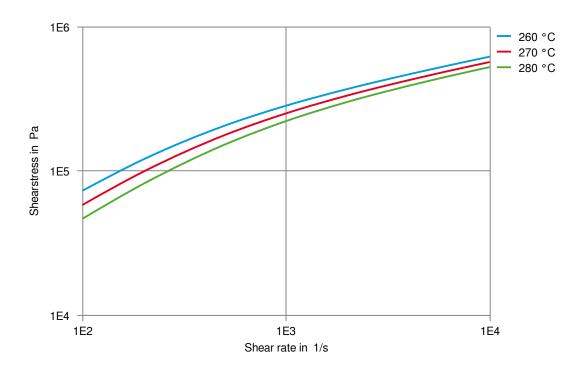


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Shearstress-shear rate (measured on Zytel® ST7301 NC010)



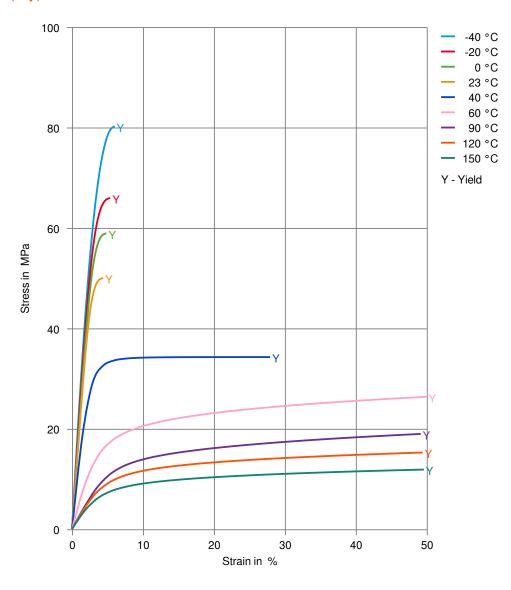
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Stress-strain (dry)



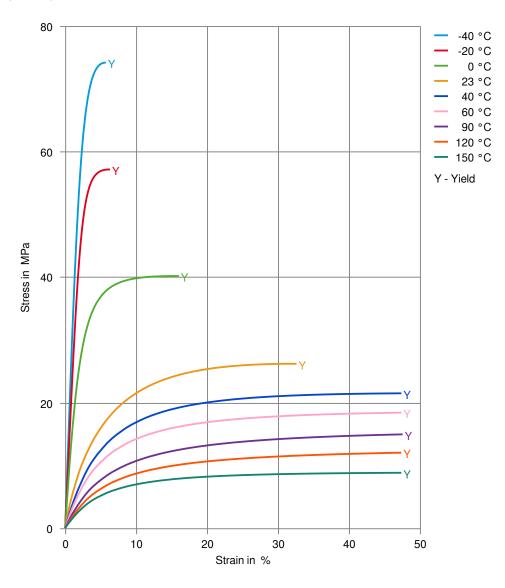
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**NYLON RESIN** 

Stress-strain (cond.)

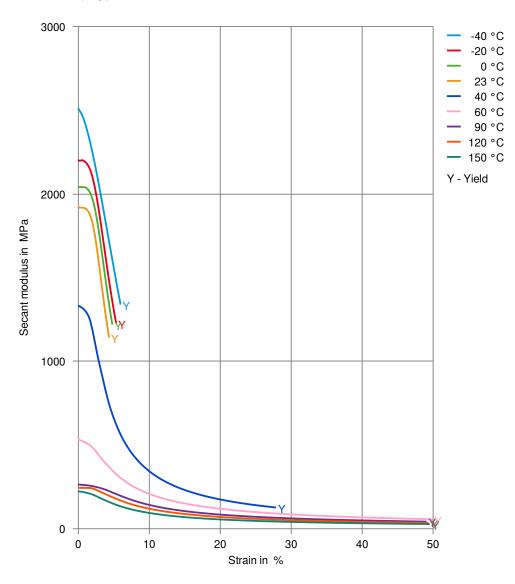


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Secant modulus-strain (dry)

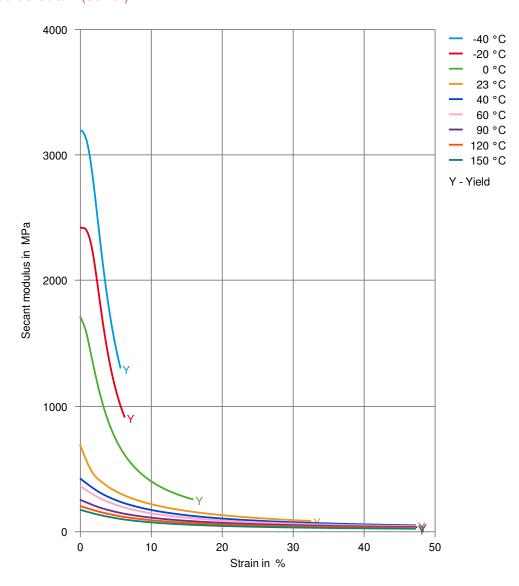


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Secant modulus-strain (cond.)

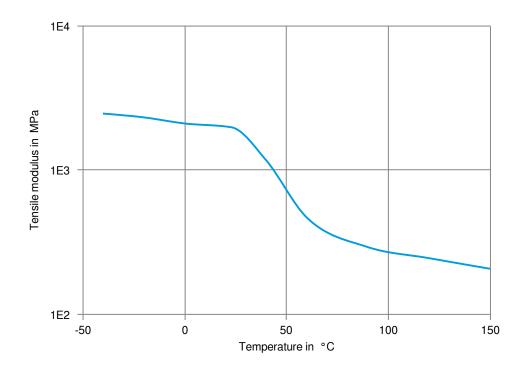


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Tensile modulus-temperature (dry)

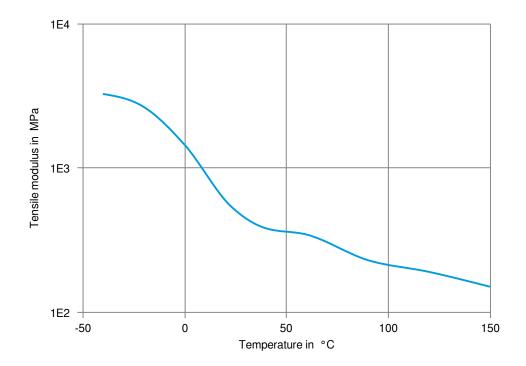


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Tensile modulus-temperature (cond.)



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# Zytel® ST7301 BK356

### **NYLON RESIN**

### 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
- 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
- X SAE 10W40 multigrade motor oil, 130°C
- X 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

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### **NYLON RESIN**

- ✓ 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
- X 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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Revised: 2025-04-23 Source: Celanese Materials Database

NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colourants or other additives may cause significant variations in data values. Properties of moulded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design, processing conditions and environmental exposure. Other than those products expressly identified as medical grade (including by MT® product designation or otherwise), Celanese's products are not intended for use in medical or dental implants. Regardless of any such product designation, any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use. To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication. Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any e

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