

# Zytel® 105F BK010

## 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® 105F BK010 is a lubricated, fast cycling, weather resistant polyamide 66 resin. Zytel® 105F BK010 contains finely dispersed carbon black.

### Product information

|                      |                                  |           |
|----------------------|----------------------------------|-----------|
| Resin Identification | PA66                             | ISO 1043  |
| Part Marking Code    | >PA66<                           | ISO 11469 |
| ISO designation      | ISO 16396-PA66,,M1CG1L1R,S14-030 |           |

### Rheological properties

|                              | dry/cond.             |                    |                 |
|------------------------------|-----------------------|--------------------|-----------------|
| Viscosity number             | 150 <sup>[1]</sup> /* | cm <sup>3</sup> /g | ISO 307, 1628   |
| Moulding shrinkage, parallel | 1.3 / -               | %                  | ISO 294-4, 2577 |
| Moulding shrinkage, normal   | 1.3 / -               | %                  | ISO 294-4, 2577 |
| [1]: Sulfuric acid 96%       |                       |                    |                 |

### Typical mechanical properties

|                                       | dry/cond.   |                   |              |
|---------------------------------------|-------------|-------------------|--------------|
| Tensile modulus                       | 3200 / 1500 | MPa               | ISO 527-1/-2 |
| Tensile stress at yield, 50mm/min     | 85 / 60     | MPa               | ISO 527-1/-2 |
| Tensile strain at yield, 50mm/min     | 4.3 / 25    | %                 | ISO 527-1/-2 |
| Nominal strain at break               | 24 / >50    | %                 | ISO 527-1/-2 |
| Tensile creep modulus, 1h             | * / 1340    | MPa               | ISO 899-1    |
| Tensile creep modulus, 1000h          | * / 600     | MPa               | ISO 899-1    |
| Charpy impact strength, 23°C          | 45 / N      | kJ/m <sup>2</sup> | ISO 179/1eU  |
| Charpy impact strength, -30°C         | 55 / 55     | kJ/m <sup>2</sup> | ISO 179/1eU  |
| Charpy notched impact strength, 23°C  | 6 / 15      | kJ/m <sup>2</sup> | ISO 179/1eA  |
| Charpy notched impact strength, -30°C | 4 / 3       | kJ/m <sup>2</sup> | ISO 179/1eA  |
| Izod notched impact strength, 23°C    | 5 / 12      | kJ/m <sup>2</sup> | ISO 180/1A   |
| Izod notched impact strength, -30°C   | 4.0 / 3.0   | kJ/m <sup>2</sup> | ISO 180/1A   |
| Poisson's ratio                       | 0.37 / 0.43 |                   |              |

### Thermal properties

|                                                | dry/cond. |    |                |
|------------------------------------------------|-----------|----|----------------|
| Melting temperature, 10°C/min                  | 263 / *   | °C | ISO 11357-1/-3 |
| Glass transition temperature, 10°C/min         | 60 / 40   | °C | ISO 11357-1/-3 |
| Temperature of deflection under load, 1.8 MPa  | 70 / *    | °C | ISO 75-1/-2    |
| Temperature of deflection under load, 0.45 MPa | 205 / *   | °C | ISO 75-1/-2    |

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|----------------------------------------------------------|---------|-------|----------------|
| Vicat softening temperature, 50°C/h 50N                  | 240 / * | °C    | ISO 306        |
| Coefficient of linear thermal expansion (CLTE), parallel | 100 / * | E-6/K | ISO 11359-1/-2 |
| Coefficient of linear thermal expansion (CLTE), normal   | 110 / * | E-6/K | ISO 11359-1/-2 |
| RTI, electrical, 0.75mm                                  | 125     | °C    | UL 746B        |
| RTI, electrical, 1.5mm                                   | 125     | °C    | UL 746B        |
| RTI, electrical, 3.0mm                                   | 125     | °C    | UL 746B        |
| RTI, electrical, 6mm                                     | 125     | °C    | UL 746B        |
| RTI, impact, 0.75mm                                      | 65      | °C    | UL 746B        |
| RTI, impact, 1.5mm                                       | 75      | °C    | UL 746B        |
| RTI, impact, 3.0mm                                       | 75      | °C    | UL 746B        |
| RTI, impact, 6mm                                         | 75      | °C    | UL 746B        |
| RTI, strength, 0.75mm                                    | 65      | °C    | UL 746B        |
| RTI, strength, 1.5mm                                     | 85 / *  | °C    | UL 746B        |
| RTI, strength, 3.0mm                                     | 85      | °C    | UL 746B        |
| RTI, strength, 6mm                                       | 85      | °C    | UL 746B        |

### Flammability

|                                         |           |        |                      |
|-----------------------------------------|-----------|--------|----------------------|
|                                         | dry/cond. |        |                      |
| Burning Behav. at 1.5mm nom. thickn.    | V-2 / *   | class  | IEC 60695-11-10      |
| Thickness tested                        | 1.5 / *   | mm     | IEC 60695-11-10      |
| UL recognition                          | yes / *   |        | UL 94                |
| Burning Behav. at thickness h           | V-2 / *   | class  | IEC 60695-11-10      |
| Thickness tested                        | 0.71 / *  | mm     | IEC 60695-11-10      |
| UL recognition                          | yes / *   |        | UL 94                |
| Oxygen index                            | 27 / *    | %      | ISO 4589-1/-2        |
| Glow Wire Flammability Index, 1.0mm     | 800 / -   | °C     | IEC 60695-2-12       |
| Glow Wire Flammability Index, 2.0mm     | 900 / -   | °C     | IEC 60695-2-12       |
| Glow Wire Flammability Index, 3.0mm     | 960 / -   | °C     | IEC 60695-2-12       |
| Glow Wire Ignition Temperature, 0.75mm  | 725 / -   | °C     | IEC 60695-2-13       |
| Glow Wire Ignition Temperature, 1.0mm   | 725 / -   | °C     | IEC 60695-2-13       |
| Glow Wire Ignition Temperature, 1.5mm   | 725 / -   | °C     | IEC 60695-2-13       |
| Glow Wire Ignition Temperature, 2.0mm   | 725 / -   | °C     | IEC 60695-2-13       |
| Glow Wire Ignition Temperature, 3.0mm   | 725 / -   | °C     | IEC 60695-2-13       |
| Glow Wire Temperature, No Flame, 0.75mm | 700 / -   | °C     | IEC 60335-1          |
| Glow Wire Temperature, No Flame, 1mm    | 700 / -   | °C     | IEC 60335-1          |
| Glow Wire Temperature, No Flame, 1.5mm  | 700 / -   | °C     | IEC 60335-1          |
| Glow Wire Temperature, No Flame, 2mm    | 700 / -   | °C     | IEC 60335-1          |
| Glow Wire Temperature, No Flame, 3mm    | 700 / -   | °C     | IEC 60335-1          |
| FMVSS Class                             | SE        |        | ISO 3795 (FMVSS 302) |
| Burning rate, Thickness 1 mm            |           | mm/min | ISO 3795 (FMVSS 302) |

### Electrical properties

|                             |           |     |               |
|-----------------------------|-----------|-----|---------------|
|                             | dry/cond. |     |               |
| Relative permittivity, 1MHz | 3.6 / 4.6 |     | IEC 62631-2-1 |
| Dissipation factor, 1MHz    | 300 / 600 | E-4 | IEC 62631-2-1 |
| Comparative tracking index  | 600 / -   |     | IEC 60112     |

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### Physical/Other properties

|                                 | dry/cond. |                   |                |
|---------------------------------|-----------|-------------------|----------------|
| Humidity absorption, 2mm        | 2.7 / *   | %                 | Sim. to ISO 62 |
| Water absorption, 2mm           | 8.5 / *   | %                 | Sim. to ISO 62 |
| Water absorption, Immersion 24h | 0.95 / *  | %                 | Sim. to ISO 62 |
| Density                         | 1140 / -  | kg/m <sup>3</sup> | ISO 1183       |

### VDA Properties

|                               | dry/cond. |       |          |
|-------------------------------|-----------|-------|----------|
| Emission of organic compounds | 6.6       | µgC/g | VDA 277  |
| Odour                         | 2.5       | class | VDA 270  |
| Fogging, G-value (condensate) | 0.1 / *   | mg    | ISO 6452 |

### Injection

|                                 |              |
|---------------------------------|--------------|
| Drying Recommended              | yes          |
| Drying Temperature              | 80 °C        |
| Drying Time, Dehumidified Dryer | 2 - 4 h      |
| Processing Moisture Content     | ≤0.2 %       |
| Melt Temperature Optimum        | 290 °C       |
| Min. melt temperature           | 280 °C       |
| Max. melt temperature           | 300 °C       |
| Screw tangential speed          | ≤0.4 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            | 190 °C       |

### Characteristics

|                         |                                                                           |
|-------------------------|---------------------------------------------------------------------------|
| Processing              | Injection Moulding                                                        |
| Delivery form           | Pellets                                                                   |
| Additives               | Release agent                                                             |
| Special characteristics | Light stabilised or stable to light, U.V. stabilised or stable to weather |

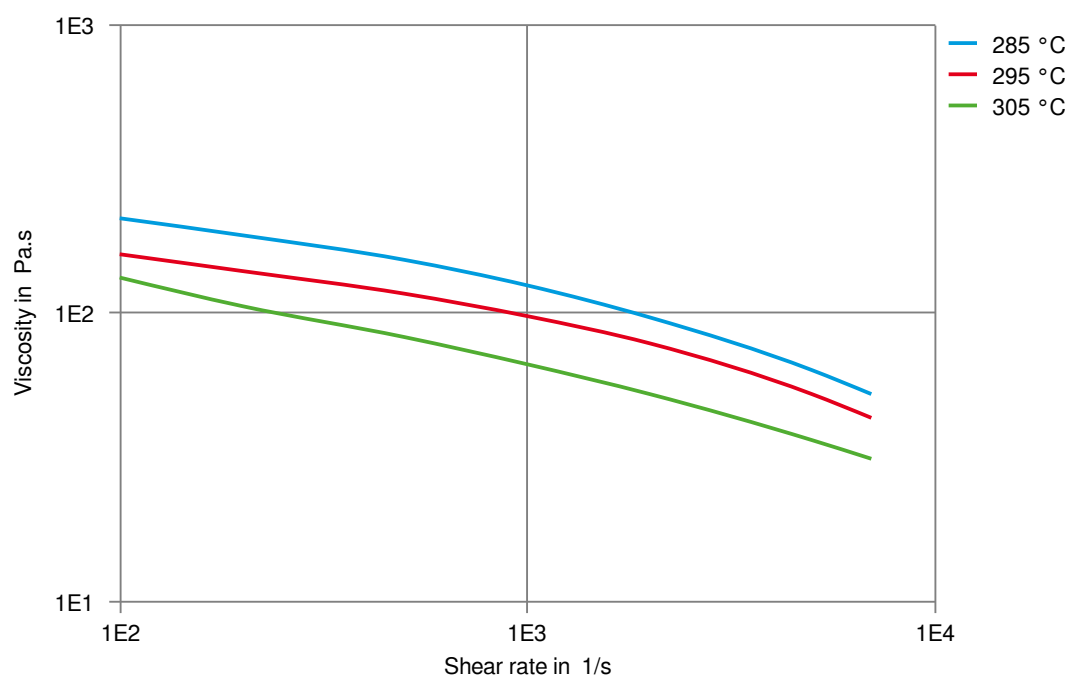
### Automotive

|               |                 |
|---------------|-----------------|
| OEM           | STANDARD        |
| Mercedes-Benz | DBL5410.00 PA66 |

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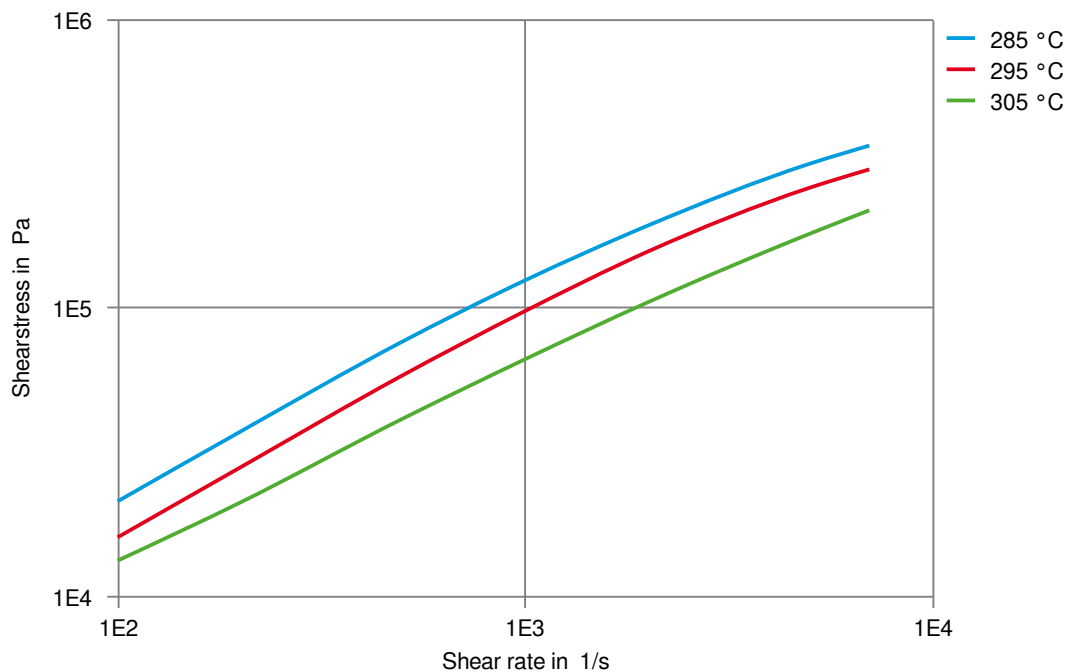
Viscosity-shear rate



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Shearstress-shear rate



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