

# Zytel® ST801A NC010A

## NYLON RESIN

Zytel® ST801A NC010A is an Unreinforced, Super Toughened, partially UV stabilized, Polyamide 66

### Product information

|                      |                                  |           |
|----------------------|----------------------------------|-----------|
| Resin Identification | PA66-HI                          | ISO 1043  |
| Part Marking Code    | >PA66-HI<                        | ISO 11469 |
| ISO designation      | ISO 16396-PA66-I,,M1G1NR,S12-020 |           |

### Rheological properties

|                              | dry/cond. |       |                     |
|------------------------------|-----------|-------|---------------------|
| Viscosity number             | 130 / *   | cm³/g | ISO 307, 1157, 1628 |
| Moulding shrinkage, parallel | 1.8 / -   | %     | ISO 294-4, 2577     |
| Moulding shrinkage, normal   | 1.4 / -   | %     | ISO 294-4, 2577     |

### Typical mechanical properties

|                                       | dry/cond.               |       |              |
|---------------------------------------|-------------------------|-------|--------------|
| Tensile Modulus                       | 2000 / 900              | MPa   | ISO 527-1/-2 |
| Stress at 50% strain                  | 49 / 44                 | MPa   | ISO 527-1/-2 |
| Strain at break, 5mm/min              | >50 / >50               | %     | ISO 527-1/-2 |
| Flexural Modulus                      | 1800 / 700              | MPa   | ISO 178      |
| Tensile creep modulus, 1h             | * / 800                 | MPa   | ISO 899-1    |
| Tensile creep modulus, 1000h          | * / 700                 | MPa   | ISO 899-1    |
| Charpy impact strength, 23°C          | - / N                   | kJ/m² | ISO 179/1eU  |
| Charpy notched impact strength, 23°C  | 70 / 100 <sup>[P]</sup> | kJ/m² | ISO 179/1eA  |
| Charpy notched impact strength, -30°C | 20 / 20                 | kJ/m² | ISO 179/1eA  |
| Izod notched impact strength, 23°C    | 80 / 90                 | kJ/m² | ISO 180/1A   |
| Izod notched impact strength, -30°C   | 15 / 15                 | kJ/m² | ISO 180/1A   |
| Izod notched impact strength, -40°C   | 20 / 17                 | kJ/m² | ISO 180/1A   |
| Poisson's ratio                       | 0.4 / 0.45              |       |              |

[P]: Partial Break

### Thermal properties

|                                                               | dry/cond. |       |                |
|---------------------------------------------------------------|-----------|-------|----------------|
| Melting temperature, 10°C/min                                 | 262 / *   | °C    | ISO 11357-1/-3 |
| Glass transition temperature, 10°C/min                        | 75 / 20   | °C    | ISO 11357-1/-3 |
| Temp. of deflection under load, 1.8 MPa                       | 63 / *    | °C    | ISO 75-1/-2    |
| Temp. of deflection under load, 0.45 MPa                      | 160 / *   | °C    | ISO 75-1/-2    |
| Vicat softening temperature, 50°C/h, 50N                      | 200 / *   | °C    | ISO 306        |
| Coeff. of linear therm. expansion, parallel, -40-23°C         | 110 / *   | E-6/K | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, parallel                   | 140 / *   | E-6/K | ISO 11359-1/-2 |
| CLTE, Parallel, 23-55°C (73-130°F)                            | 140 / -   | E-6/K | ASTM E 831     |
| Coeff. of linear therm. expansion, parallel, 55-160°C         | 160 / *   | E-6/K | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, normal, -40-23°C           | 110 / *   | E-6/K | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, normal                     | 130 / *   | E-6/K | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, Normal, 23-55°C (73-130°F) | 130 / -   | E-6/K | ASTM E 831     |
| Coeff. of linear therm. expansion, normal, 55-160°C           | 130 / *   | E-6/K | ISO 11359-1/-2 |



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|                         |      |    |         |
|-------------------------|------|----|---------|
| RTI, electrical, 0.75mm | 125  | °C | UL 746B |
| RTI, electrical, 1.5mm  | 125  | °C | UL 746B |
| RTI, electrical, 3mm    | 125  | °C | UL 746B |
| RTI, impact, 0.75mm     | 75   | °C | UL 746B |
| RTI, impact, 1.5mm      | 75   | °C | UL 746B |
| RTI, impact, 3mm        | 75   | °C | UL 746B |
| RTI, strength, 0.75mm   | 85   | °C | UL 746B |
| RTI, strength, 1.5mm    | 85/* | °C | UL 746B |
| RTI, strength, 3mm      | 85   | °C | UL 746B |

### Flammability

|                                      |           |        |                      |
|--------------------------------------|-----------|--------|----------------------|
|                                      | dry/cond. |        |                      |
| Burning Behav. at 1.5mm nom. thickn. | HB/*      | class  | UL 94                |
| Thickness tested                     | 1.5/*     | mm     | UL 94                |
| UL recognition                       | yes/*     |        | UL 94                |
| Burning Behav. at thickness h        | HB/*      | class  | UL 94                |
| Thickness tested                     | 0.81/*    | mm     | UL 94                |
| UL recognition                       | yes/*     |        | UL 94                |
| Oxygen index                         | 20/*      | %      | ISO 4589-1/-2        |
| FMVSS Class                          | B         |        | ISO 3795 (FMVSS 302) |
| Burning rate, Thickness 1 mm         | <80       | mm/min | ISO 3795 (FMVSS 302) |
| Hot Wire Ignition, 1.5mm             | 15/*      | s      | UL 746A              |
| Hot Wire Ignition, 3mm               | 20/*      | s      | UL 746A              |

### Electrical properties

|                                               |                      |       |               |
|-----------------------------------------------|----------------------|-------|---------------|
|                                               | dry/cond.            |       |               |
| Relative permittivity, 100Hz                  | 3.5/5.9              |       | IEC 62631-2-1 |
| Relative permittivity, 1MHz                   | 3.3/3.5              |       | IEC 62631-2-1 |
| Dissipation factor, 100Hz                     | 50/1580              | E-4   | IEC 62631-2-1 |
| Dissipation factor, 1MHz                      | 100/380              | E-4   | IEC 62631-2-1 |
| Volume resistivity                            | >1E13/8.7E10         | Ohm.m | IEC 62631-3-1 |
| Surface resistivity                           | */1E12               | Ohm   | IEC 62631-3-2 |
| Electric strength                             | 25/-                 | kV/mm | IEC 60243-1   |
| Comparative tracking index                    | 600/-                |       | IEC 60112     |
| Electric Strength, Short Time, 2mm            | 25/26                | kV/mm | IEC 60243-1   |
| High Amperage Arc Ignition Resistance, 1.5 mm | 200 <sup>[1]/*</sup> | arcs  | UL 746A       |
| High Amperage Arc Ignition Category, 1.5 mm   | 200 <sup>[1]/*</sup> | class | UL 746A       |
| [1]: >200                                     |                      |       |               |

### Other properties

|                                 |           |                   |                |
|---------------------------------|-----------|-------------------|----------------|
|                                 | dry/cond. |                   |                |
| Humidity absorption, 2mm        | 2/*       | %                 | Sim. to ISO 62 |
| Water absorption, 2mm           | 6.5/*     | %                 | Sim. to ISO 62 |
| Water absorption, Immersion 24h | 1.1/*     | %                 | Sim. to ISO 62 |
| Density                         | 1070/-    | kg/m <sup>3</sup> | ISO 1183       |



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### 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       | Internal |
| Min. melt temperature           | 280 °C       |          |
| Max. melt temperature           | 300 °C       |          |
| Screw tangential speed          | ≤0.3 m/s     |          |
| Mold Temperature Optimum        | 80 °C        |          |
| Min. mould temperature          | 50 °C        |          |
| Max. mould temperature          | 100 °C       |          |
| Hold pressure range             | 50 - 100 MPa |          |
| Hold pressure time              | 4 s/mm       |          |
| Ejection temperature            | 190 °C       | Internal |

### Extrusion

|                                 |              |
|---------------------------------|--------------|
| Drying Temperature              | 80 °C        |
| Drying Time, Dehumidified Dryer | 3 - 4 h      |
| Processing Moisture Content     | ≤0.06 %      |
| Melt Temperature Optimum        | 280 °C       |
| Melt Temperature Range          | 275 - 290 °C |

### Characteristics

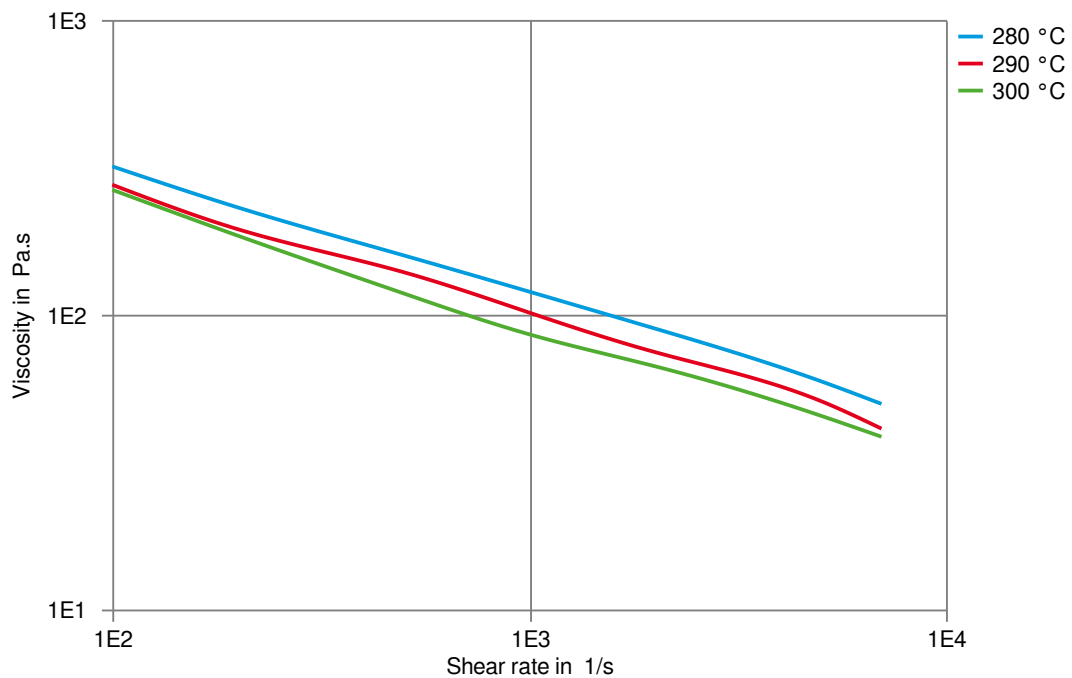
|           |               |
|-----------|---------------|
| Additives | Release agent |
|-----------|---------------|



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NYLON RESIN

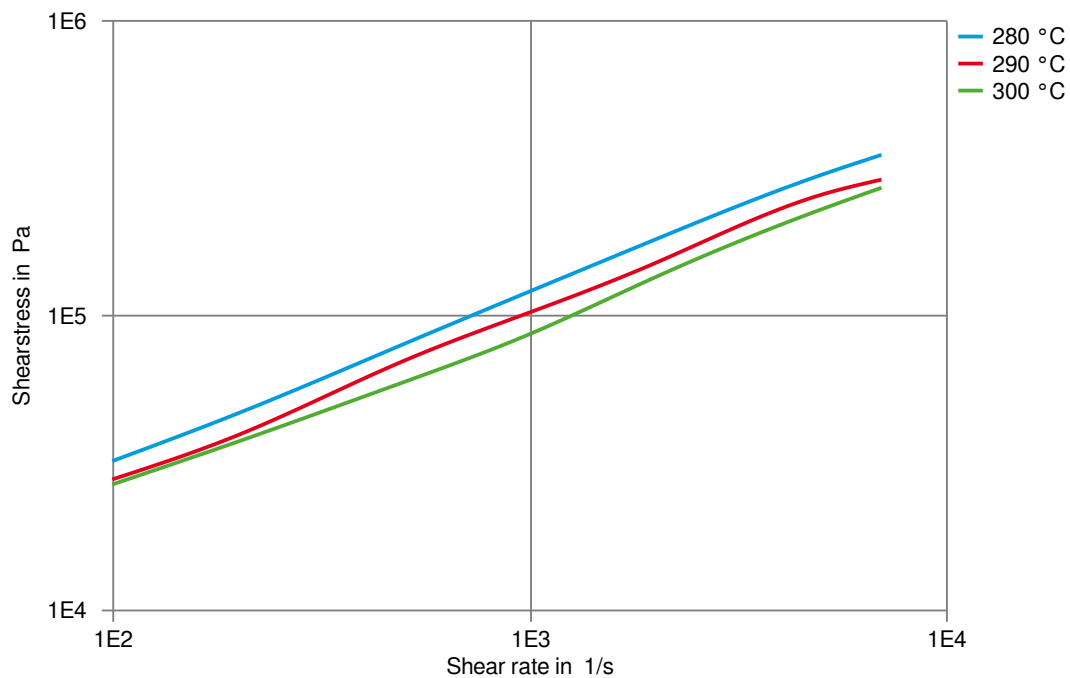
Viscosity-shear rate



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Shearstress-shear rate



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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

#### 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
- ✗ 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).

