

# Zytel® HTN54G15HSLR NC010

## HIGH PERFORMANCE POLYAMIDE RESIN

Zytel® HTN high performance polyamide resins feature high retention of properties upon exposure to elevated temperature, to high moisture, and to harsh chemical environments. Polymer families and grades of Zytel® HTN are tailored to optimize performance as well as processability.

Typical applications with Zytel® HTN include demanding applications in the automotive, electrical and electronics, domestic appliances, and construction industries.

Zytel® HTN54G15HSLR NC010 is a 15% glass reinforced, toughened, heat stabilized high performance polyamide resin. It is also a PPA resin.

### Product information

|                      |                                     |           |
|----------------------|-------------------------------------|-----------|
| Resin Identification | PA-IGF15                            | ISO 1043  |
| Part Marking Code    | >PA-IGF15<                          | ISO 11469 |
| Part Marking Code    | >PPA-IGF15<                         | SAE J1344 |
| ISO designation      | ISO 16396-PA-I,GF15,M1GHNRW,S10-050 |           |

### Rheological properties

|                              | dry/cond. |   |                 |
|------------------------------|-----------|---|-----------------|
| Moulding shrinkage, parallel | 0.4 / -   | % | ISO 294-4, 2577 |
| Moulding shrinkage, normal   | 0.7 / -   | % | ISO 294-4, 2577 |

### Typical mechanical properties

|                                      | dry/cond.   |                   |              |
|--------------------------------------|-------------|-------------------|--------------|
| Tensile modulus                      | 5500 / 5500 | MPa               | ISO 527-1/-2 |
| Tensile stress at break, 5mm/min     | 130 / 100   | MPa               | ISO 527-1/-2 |
| Tensile strain at break, 5mm/min     | 3.7 / 2.7   | %                 | ISO 527-1/-2 |
| Flexural modulus                     | 4900 / -    | MPa               | ISO 178      |
| Tensile creep modulus, 1h            | * / 5500    | MPa               | ISO 899-1    |
| Tensile creep modulus, 1000h         | * / 5000    | MPa               | ISO 899-1    |
| Charpy impact strength, 23°C         | 70 / 60     | kJ/m <sup>2</sup> | ISO 179/1eU  |
| Charpy notched impact strength, 23°C | 6 / -       | kJ/m <sup>2</sup> | ISO 179/1eA  |
| Poisson's ratio                      | 0.35 / 0.35 |                   |              |

### Thermal properties

|  | dry/cond. |       |                |
|--|-----------|-------|----------------|
| Melting temperature, 10°C/min                            | 304 / *   | °C    | ISO 11357-1/-3 |
| Glass transition temperature, 10°C/min                   | 120 / 65  | °C    | ISO 11357-1/-3 |
| Temperature of deflection under load, 1.8 MPa            | 235 / *   | °C    | ISO 75-1/-2    |
| Temperature of deflection under load, 0.45 MPa           | 280 / *   | °C    | ISO 75-1/-2    |
| Coeff. of linear therm. expansion, parallel, -40-23°C    | 32 / *    | E-6/K | ISO 11359-1/-2 |
| Coefficient of linear thermal expansion (CLTE), parallel | 28 / *    | E-6/K | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, parallel, 55-160°C    | 20 / *    | E-6/K | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, normal, -40-23°C      | 70 / *    | E-6/K | ISO 11359-1/-2 |
| Coefficient of linear thermal expansion (CLTE), normal   | 70 / *    | E-6/K | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, normal, 55-160°C      | 104 / *   | E-6/K | ISO 11359-1/-2 |

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### Flammability

|                                      | dry/cond. |        |                      |
|--------------------------------------|-----------|--------|----------------------|
| Burning Behav. at 1.5mm nom. thickn. | HB / *    | class  | IEC 60695-11-10      |
| Thickness tested                     | 1.5 / *   | mm     | IEC 60695-11-10      |
| UL recognition                       | yes / *   |        | UL 94                |
| Burning Behav. at thickness h        | HB / *    | class  | IEC 60695-11-10      |
| Thickness tested                     | 0.8 / *   | mm     | IEC 60695-11-10      |
| UL recognition                       | yes / *   |        | UL 94                |
| Oxygen index                         | 23 / *    | %      | ISO 4589-1/-2        |
| FMVSS Class                          | B         |        | ISO 3795 (FMVSS 302) |
| Burning rate, Thickness 1 mm         | <80       | mm/min | ISO 3795 (FMVSS 302) |

### Electrical properties

|                              | dry/cond.     |       |               |
|------------------------------|---------------|-------|---------------|
| Relative permittivity, 100Hz | 4.2 / -       |       | IEC 62631-2-1 |
| Relative permittivity, 1MHz  | 3.9 / -       |       | IEC 62631-2-1 |
| Dissipation factor, 100Hz    | 55 / -        | E-4   | IEC 62631-2-1 |
| Dissipation factor, 1MHz     | 135 / -       | E-4   | IEC 62631-2-1 |
| Volume resistivity           | >1E13 / >1E13 | Ohm.m | IEC 62631-3-1 |
| Surface resistivity          | * / >1E15     | Ohm   | IEC 62631-3-2 |
| Electric strength            | 16.5 / -      | kV/mm | IEC 60243-1   |
| Comparative tracking index   | 575 / 575     |       | IEC 60112     |

### Physical/Other properties

|         | dry/cond. |       |          |
|---------|-----------|-------|----------|
| Density | 1250 / -  | kg/m³ | ISO 1183 |

### Injection

|                                 |         |
|---------------------------------|---------|
| Drying Recommended              | yes     |
| Drying Temperature              | 100 °C  |
| Drying Time, Dehumidified Dryer | 6 - 8 h |
| Processing Moisture Content     | ≤0.1 %  |
| Melt Temperature Optimum        | 325 °C  |
| Min. melt temperature           | 320 °C  |
| Max. melt temperature           | 330 °C  |
| Mold Temperature Optimum        | 100 °C  |
| Min. mould temperature          | 90 °C   |
| Max. mould temperature          | 110 °C  |
| Ejection temperature            | 260 °C  |

### Characteristics

|                         |   |
|-------------------------|---|
| Processing              | Injection Moulding                                      |
| Delivery form           | Pellets   |
| Additives               | Release agent   |
| Special characteristics | Heat stabilised or stable to heat, Hydrolysis resistant |

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### Additional information

Injection molding

During molding, use proper protective equipment and adequate ventilation. Avoid exposure to fumes and limit the holdup time and temperature of the resin in the machine. Purge degraded resin carefully with HDPE.

### Automotive

OEM

STANDARD

ADDITIONAL INFORMATION

Ford

WSS-M98P14-A3

General Motors

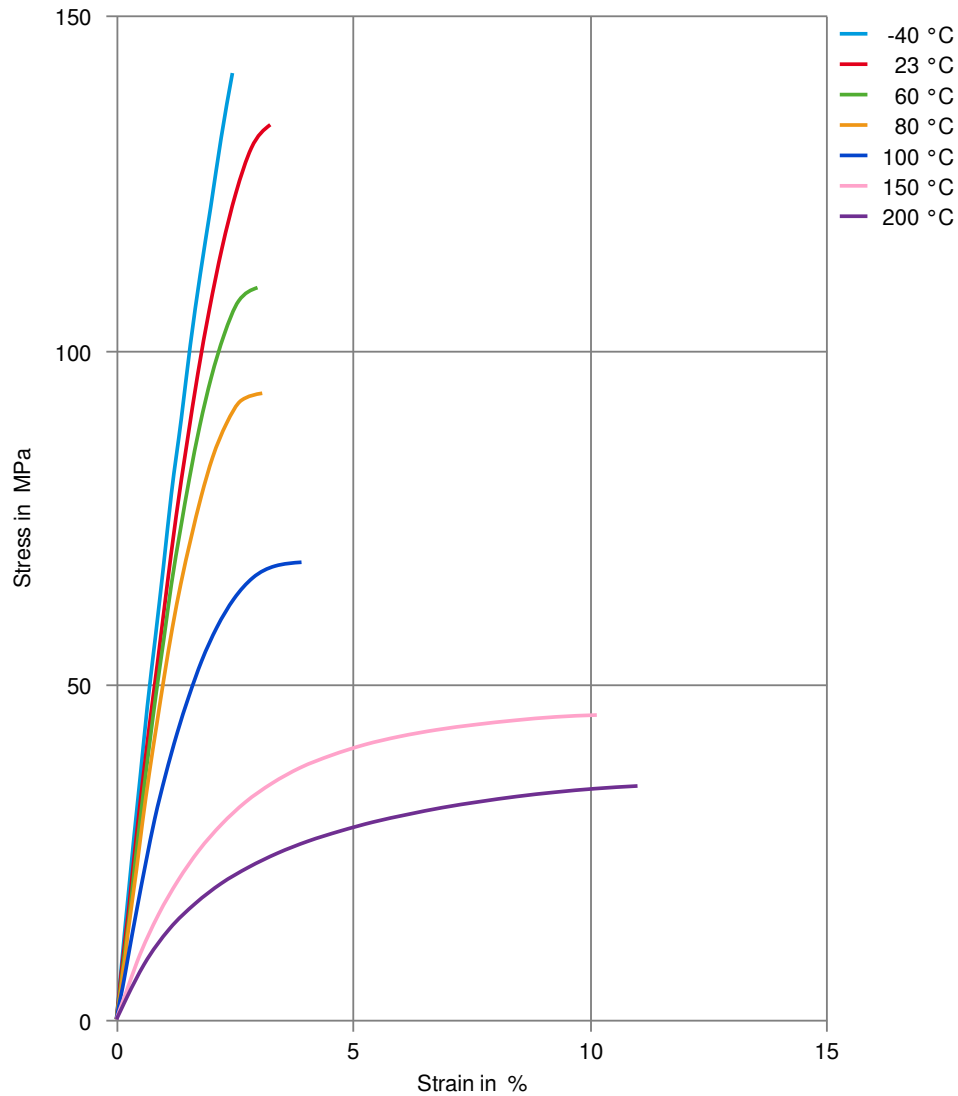
GMW18066P-PPA-GF15

Natural

### Stress-strain (dry)

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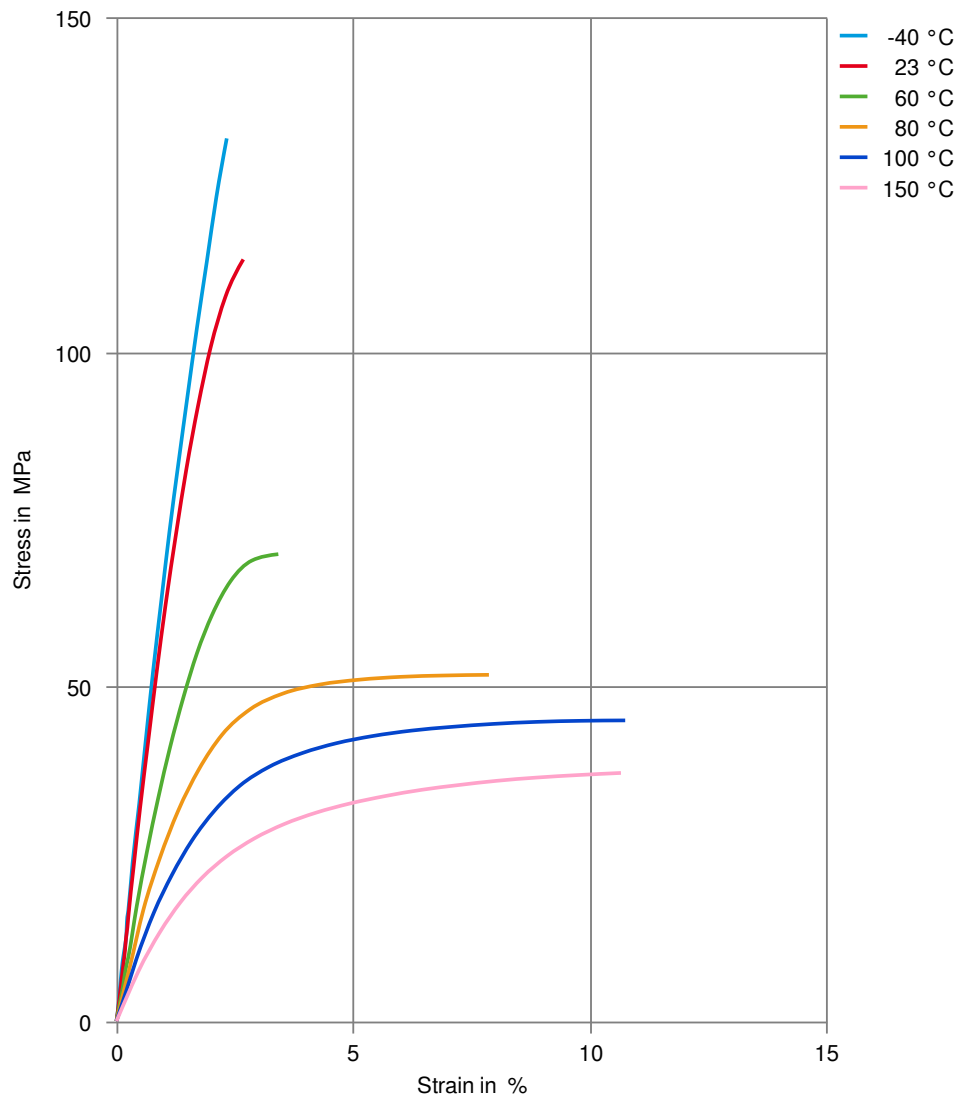
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## HIGH PERFORMANCE POLYAMIDE RESIN

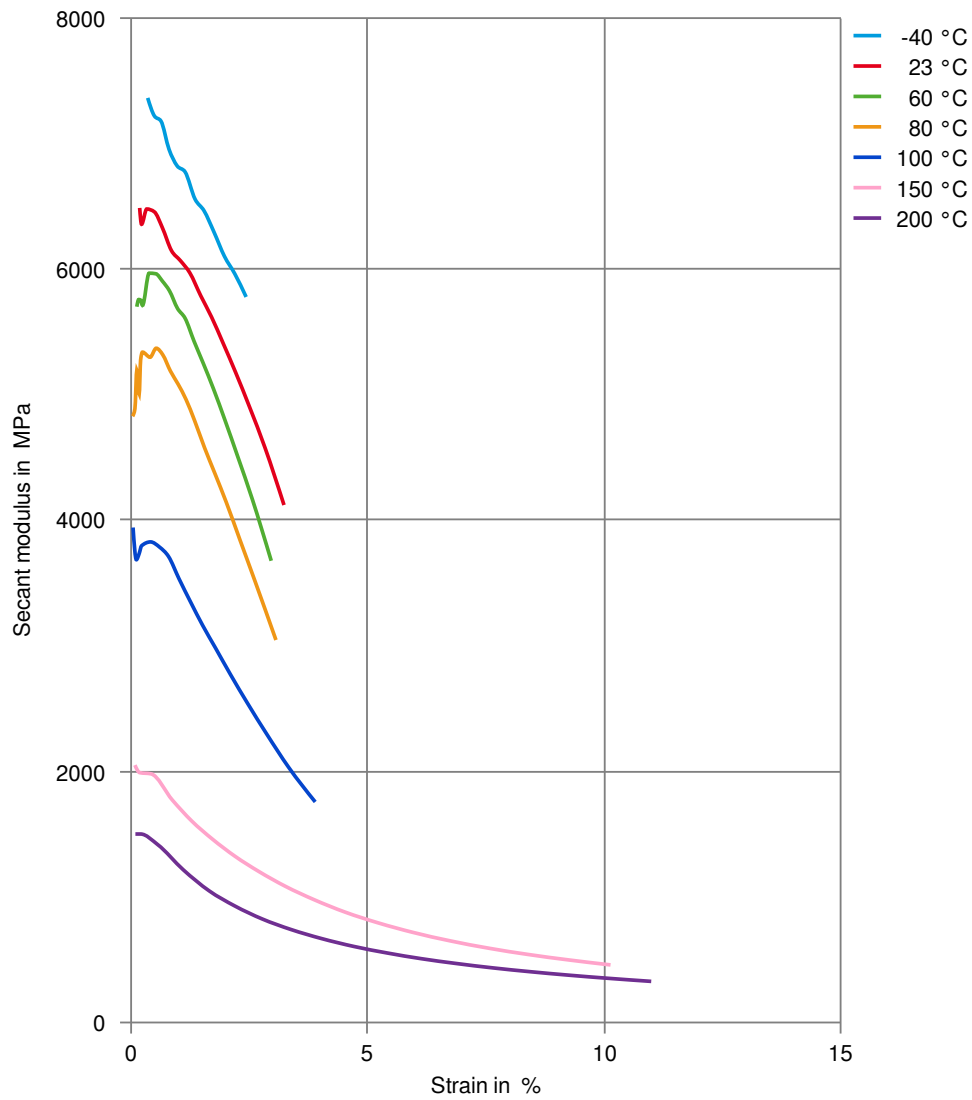
### Stress-strain (cond.)



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HIGH PERFORMANCE POLYAMIDE RESIN

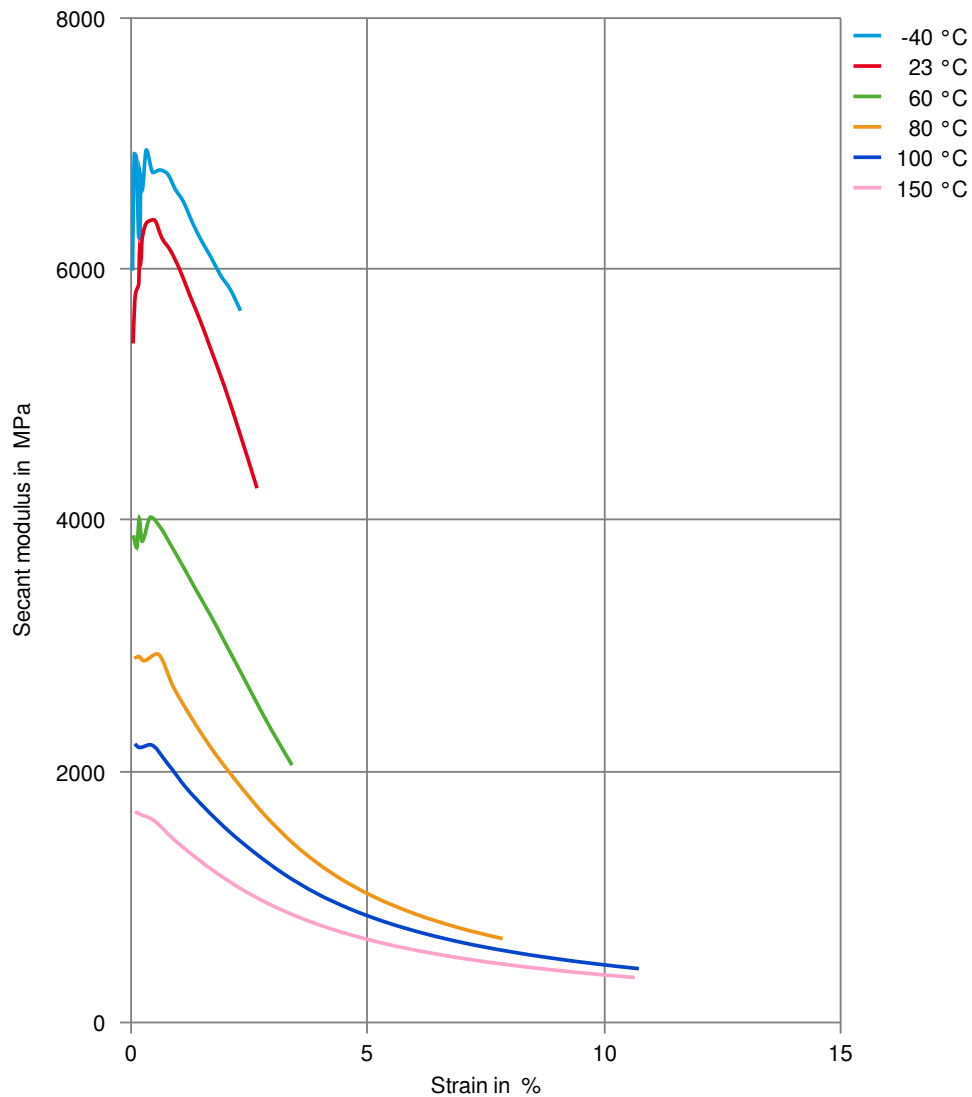
## Secant modulus-strain (dry)



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## HIGH PERFORMANCE POLYAMIDE RESIN

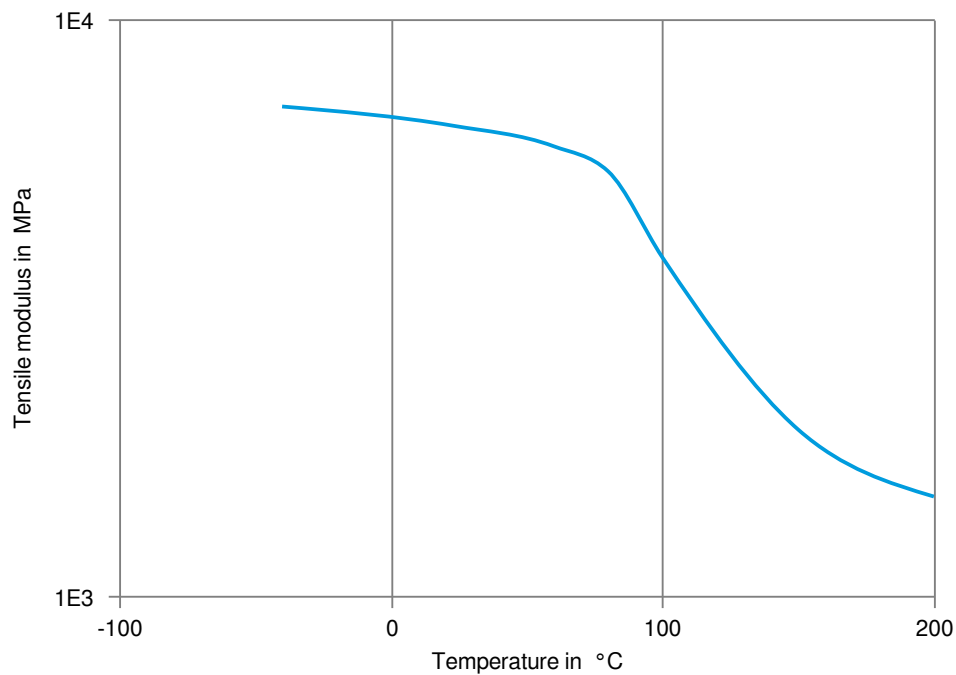
### Secant modulus-strain (cond.)



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HIGH PERFORMANCE POLYAMIDE RESIN

Tensile modulus-temperature (dry)

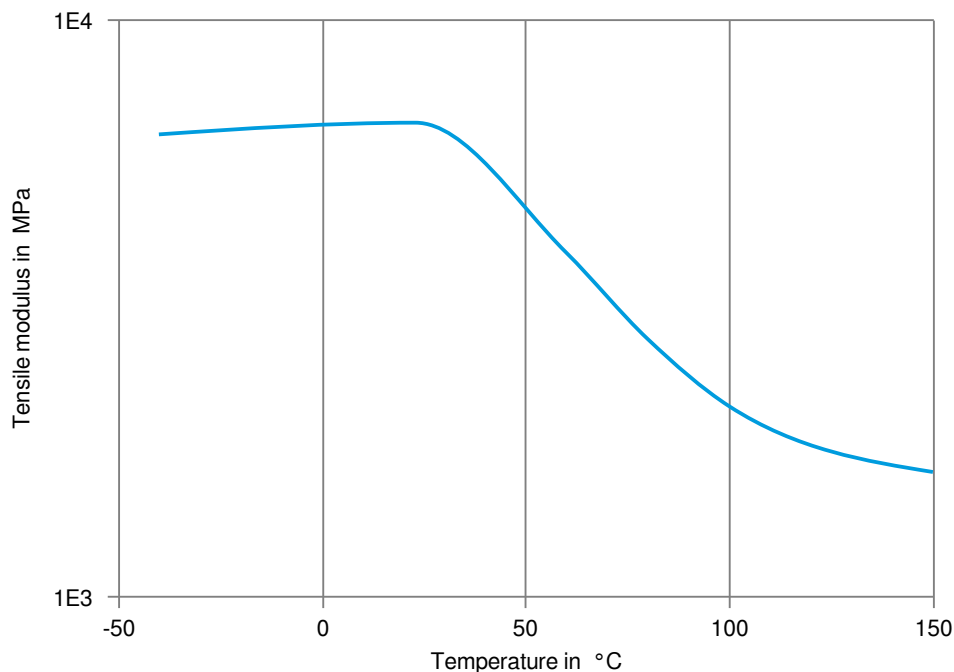




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### Tensile modulus-temperature (cond.)



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