

# Zytel® 80G43EF BK314LM (PRELIMINARY)

## 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® 80G43EF BK314LM is a 43% glass fiber reinforced, low halide, heat stabilised, laser markable black polyamide 66 resin with superior impact resistance.

### Product information

|                      |                                      |           |
|----------------------|--------------------------------------|-----------|
| Resin Identification | PA66-IGF43                           | ISO 1043  |
| Part Marking Code    | >PA66-IGF43<                         | ISO 11469 |
| ISO designation      | ISO 16396-PA66-I,GF43,M1CGHR,S14-120 |           |

### Rheological properties

|                                      | dry/cond.            |                    |                     |
|--------------------------------------|----------------------|--------------------|---------------------|
| Viscosity number                     | 140 <sup>[1]/*</sup> | cm <sup>3</sup> /g | ISO 307, 1157, 1628 |
| Moulding shrinkage, parallel         | 0.2 / -              | %                  | ISO 294-4, 2577     |
| Moulding shrinkage, normal           | 0.7 / -              | %                  | ISO 294-4, 2577     |
| Melt viscosity , @ 1000 sec-1, 280°C | 220 / *              | Pa.s               | ISO 11443           |

[1]: Sulfuric Acid

### Typical mechanical properties

|                                       | dry/cond.    |                   |              |
|---------------------------------------|--------------|-------------------|--------------|
| Tensile Modulus                       | 12000 / 8600 | MPa               | ISO 527-1/-2 |
| Stress at break, 5mm/min              | 180 / 130    | MPa               | ISO 527-1/-2 |
| Strain at break, 5mm/min              | 3.3 / 6.5    | %                 | ISO 527-1/-2 |
| Flexural Strength                     | 260 / 180    | MPa               | ISO 178      |
| Charpy impact strength, 23°C          | 88 / 88      | kJ/m <sup>2</sup> | ISO 179/1eU  |
| Charpy impact strength, -30°C         | 99 / 88      | kJ/m <sup>2</sup> | ISO 179/1eU  |
| Charpy impact strength, -40°C         | 100 / 96     | kJ/m <sup>2</sup> | ISO 179/1eU  |
| Charpy notched impact strength, 23°C  | 23 / 28      | kJ/m <sup>2</sup> | ISO 179/1eA  |
| Charpy notched impact strength, -30°C | 16 / 16      | kJ/m <sup>2</sup> | ISO 179/1eA  |
| Charpy notched impact strength, -40°C | 15 / 15      | kJ/m <sup>2</sup> | ISO 179/1eA  |
| Poisson's ratio                       | 0.33 / 0.34  |                   |              |



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### Thermal properties

|                                                       | dry/cond. |       |                |
|-------------------------------------------------------|-----------|-------|----------------|
| Melting temperature, 10°C/min                         | 262 / *   | °C    | ISO 11357-1/-3 |
| Temp. of deflection under load, 1.8 MPa               | 250 / *   | °C    | ISO 75-1/-2    |
| Coeff. of linear therm. expansion, parallel, -40-23°C | 15 / *    | E-6/K | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, parallel           | 16 / *    | E-6/K | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, parallel, 55-160°C | 12 / *    | E-6/K | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, normal, -40-23°C   | 63 / *    | E-6/K | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, normal             | 92 / *    | E-6/K | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, normal, 55-160°C   | 115 / *   | E-6/K | ISO 11359-1/-2 |

### Flammability

|                                      | dry/cond.             |        |                      |
|--------------------------------------|-----------------------|--------|----------------------|
| Burning Behav. at 1.5mm nom. thickn. | HB / * <sup>[A]</sup> | class  | UL 94                |
| Thickness tested                     | 1.5 / *               | mm     | UL 94                |
| FMVSS Class                          | SE / B                |        | ISO 3795 (FMVSS 302) |
| Burning rate, Thickness 1 mm         | 20                    | mm/min | ISO 3795 (FMVSS 302) |
| [A]: Assessed                        |                       |        |                      |

### Electrical properties

|                                    | dry/cond.    |       |               |
|------------------------------------|--------------|-------|---------------|
| Volume resistivity                 | >1E13 / 1E10 | Ohm.m | IEC 62631-3-1 |
| Comparative tracking index         | 600 / -      |       | IEC 60112     |
| Electric Strength, Short Time, 1mm | 37 / 36      | kV/mm | IEC 60243-1   |

### Other properties

|                          | dry/cond. |       |                |
|--------------------------|-----------|-------|----------------|
| Humidity absorption, 2mm | 1.4 / *   | %     | Sim. to ISO 62 |
| Water absorption, 2mm    | 3.8 / *   | %     | Sim. to ISO 62 |
| Density                  | 1430 / -  | kg/m³ | ISO 1183       |

### Injection

|                                 |          |      |          |
|---------------------------------|----------|------|----------|
| Drying Recommended              | yes      |      |          |
| Drying Temperature              | 80       | °C   |          |
| Drying Time, Dehumidified Dryer | 2 - 4    | h    |          |
| Processing Moisture Content     | ≤0.2     | %    |          |
| Melt Temperature Optimum        | 295      | °C   | Internal |
| Min. melt temperature           | 285      | °C   |          |
| Max. melt temperature           | 305      | °C   |          |
| Screw tangential speed          | ≤0.2     | 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              | 3        | s/mm |          |
| Ejection temperature            | 195      | °C   | Internal |



# Zytel® 80G43EF BK314LM (PRELIMINARY)

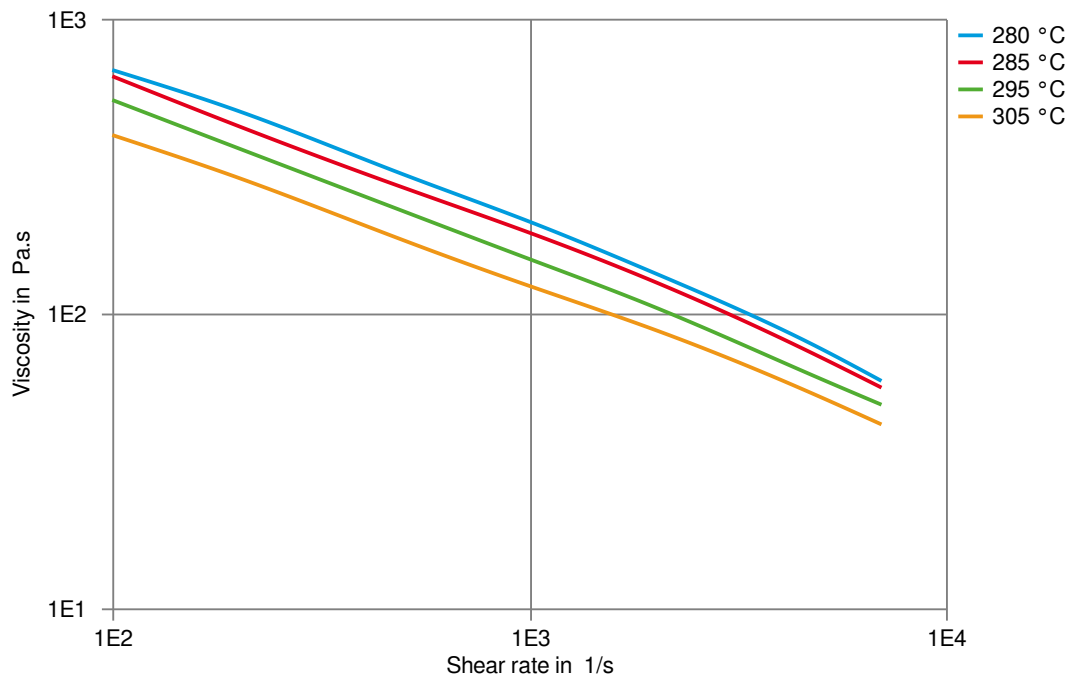
## NYLON RESIN

### Characteristics

Additives

Release agent, Low halide content

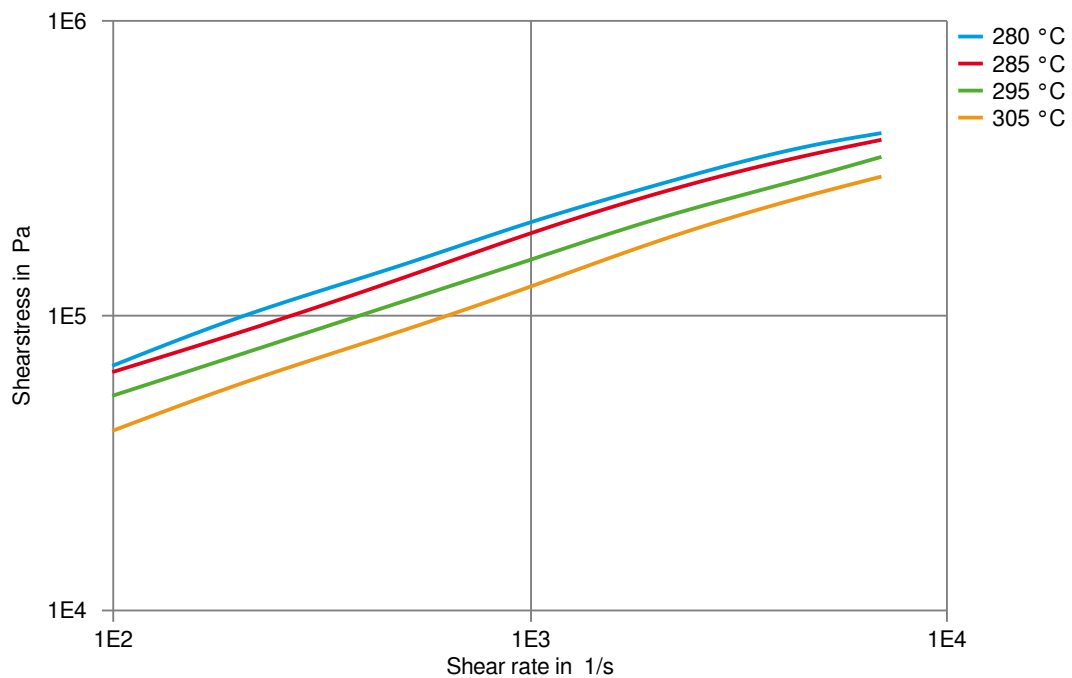
### Viscosity-shear rate



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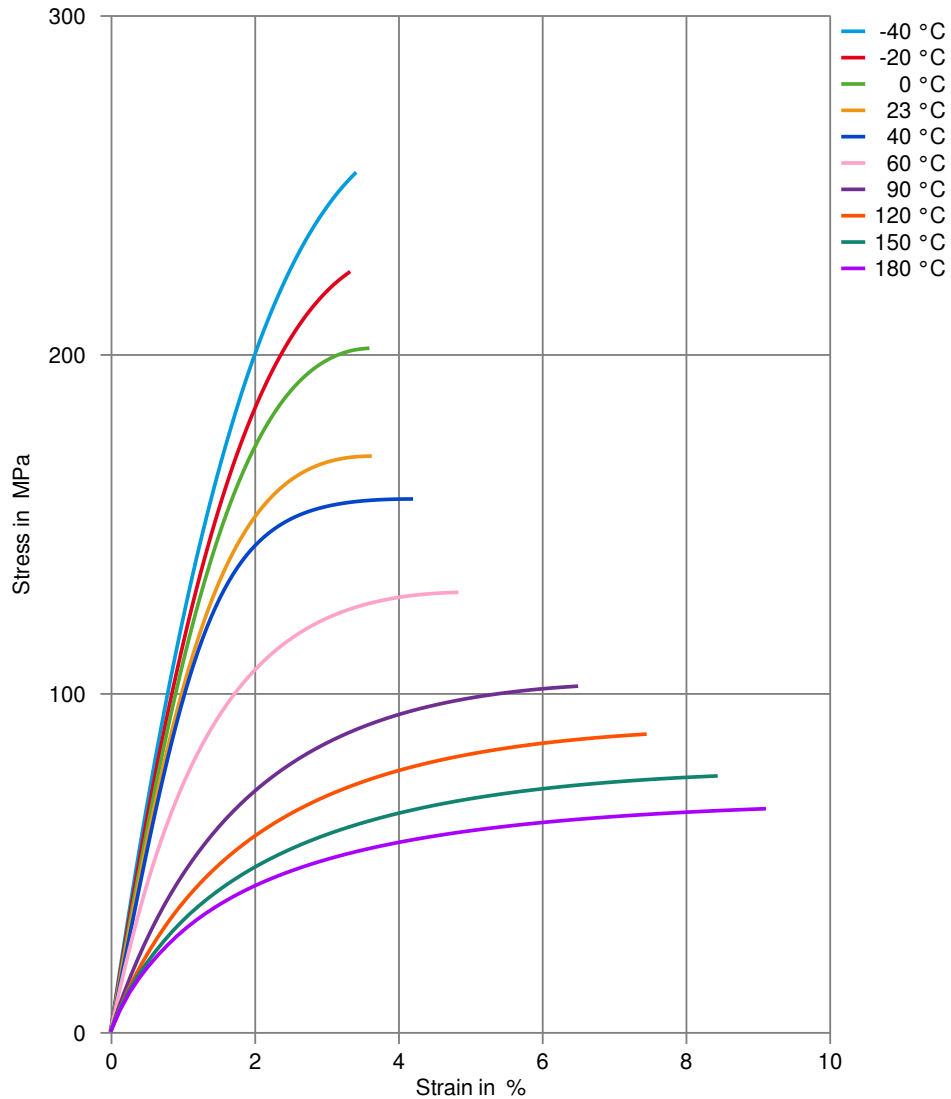
### Shearstress-shear rate



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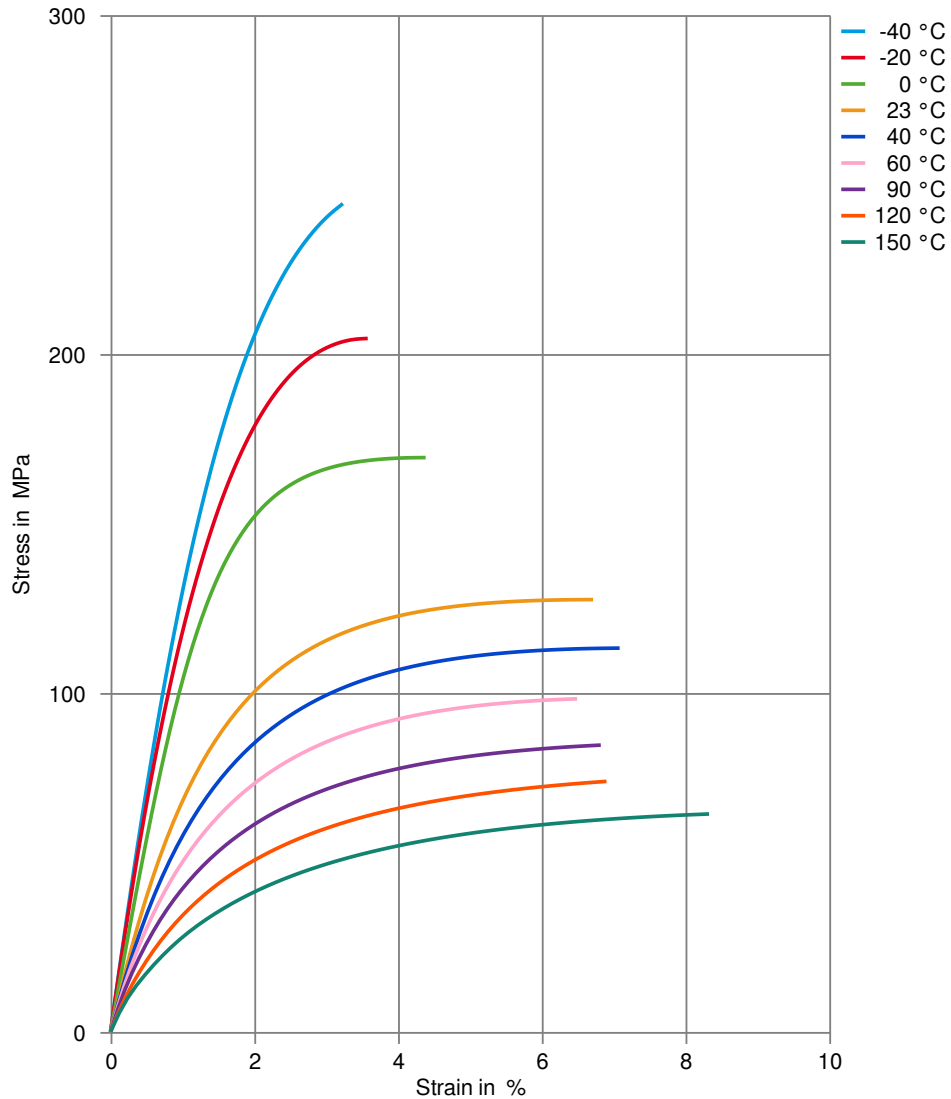
### Stress-strain (dry)



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## NYLON RESIN

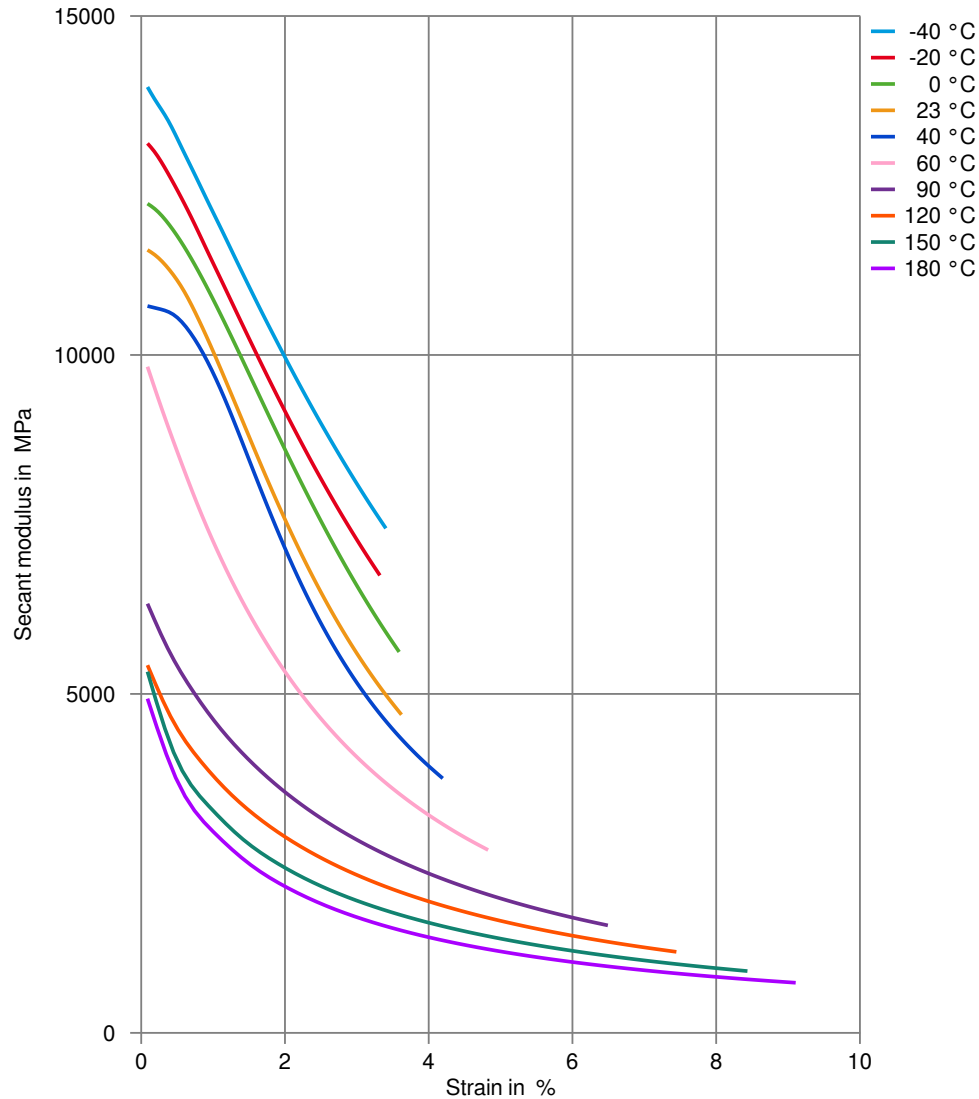
### Stress-strain (cond.)



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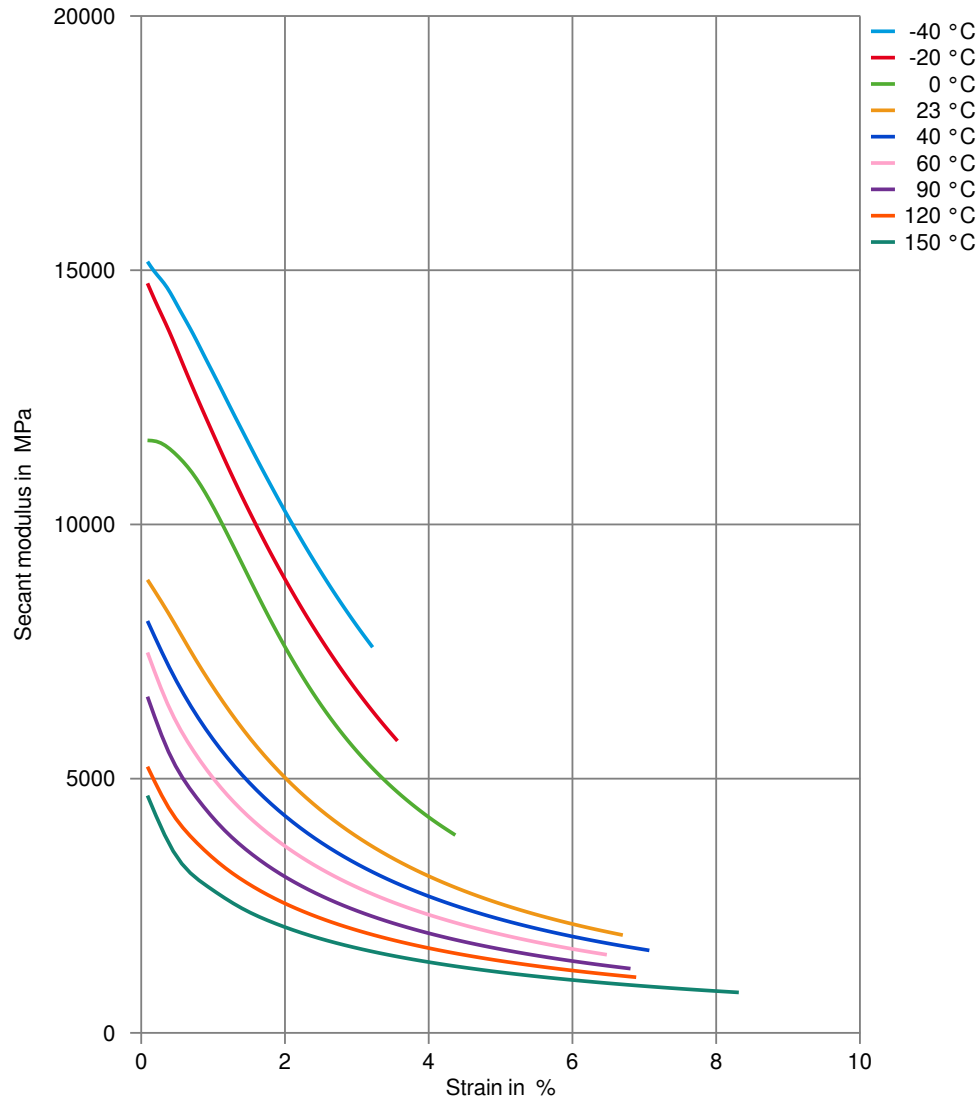
### Secant modulus-strain (dry)



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## NYLON RESIN

### Secant modulus-strain (cond.)

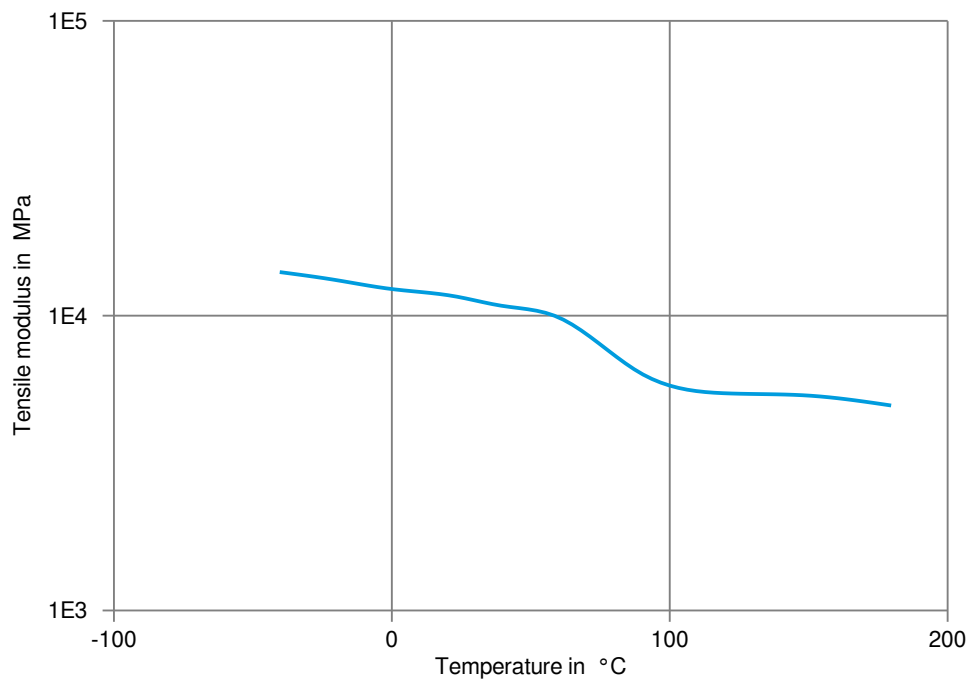




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### Tensile modulus-temperature (dry)



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Tensile modulus-temperature (cond.)

