

# Rynite® 530 NC010

## THERMOPLASTIC POLYESTER RESIN

Common features of Rynite® thermoplastic polyester include mechanical and physical properties such as excellent balance of strength and stiffness, dimensional stability, creep resistance, heat resistance, high surface gloss and good inherent electrical properties at elevated temperature. It can be processed over a broad temperature range and has excellent flow properties.

Rynite® thermoplastic polyester resins are typically used in demanding applications in the automotive, electrical and electronics, appliances where they successfully replace metals and thermosets, as well as other thermoplastic polymers.

If recycling is not possible, we recommend, as the preferred option, incineration with energy recovery (-30 kJ/g of base polymer) in appropriately equipped installations. For disposal, local regulations have to be observed.

Rynite® 530 NC010 is a 30% glass reinforced modified polyethylene terephthalate resin.

### Product information

|                      |            |           |
|----------------------|------------|-----------|
| Resin Identification | PET-GF30   | ISO 1043  |
| Part Marking Code    | >PET-GF30< | ISO 11469 |

### Rheological properties

|                                                |                       |                 |
|------------------------------------------------|-----------------------|-----------------|
| Viscosity number                               | 55 cm <sup>3</sup> /g | ISO 307, 1628   |
| Moulding shrinkage, parallel                   | 0.2 %                 | ISO 294-4, 2577 |
| Moulding shrinkage, normal                     | 0.8 %                 | ISO 294-4, 2577 |
| Postmoulding shrinkage, normal, 48h at 80 °C   | 0.45 %                | ISO 294-4       |
| Postmoulding shrinkage, parallel, 48h at 80 °C | 0.1 %                 | ISO 294-4       |

### Typical mechanical properties

|                                        |                      |              |
|----------------------------------------|----------------------|--------------|
| Tensile modulus                        | 11000 MPa            | ISO 527-1/-2 |
| Tensile stress at break, 5mm/min       | 158 MPa              | ISO 527-1/-2 |
| Tensile strain at break, 5mm/min       | 2.5 %                | ISO 527-1/-2 |
| Flexural modulus                       | 8950 MPa             | ISO 178      |
| Flexural strength                      | 230 MPa              | ISO 178      |
| Compressive strength                   | 230 MPa              | ISO 604      |
| Tensile creep modulus, 1h              | 10800 MPa            | ISO 899-1    |
| Tensile creep modulus, 1000h           | 8800 MPa             | ISO 899-1    |
| Charpy impact strength, 23 °C          | 60 kJ/m <sup>2</sup> | ISO 179/1eU  |
| Charpy impact strength, -30 °C         | 45 kJ/m <sup>2</sup> | ISO 179/1eU  |
| Charpy notched impact strength, 23 °C  | 11 kJ/m <sup>2</sup> | ISO 179/1eA  |
| Charpy notched impact strength, -30 °C | 11 kJ/m <sup>2</sup> | ISO 179/1eA  |
| Charpy notched impact strength, -40 °C | 10 kJ/m <sup>2</sup> | ISO 179/1eA  |
| Hardness, Rockwell, M-scale            | 100                  | ISO 2039-2   |
| Hardness, Rockwell, R-scale            | 120                  | ISO 2039-2   |
| Ball indentation hardness, H 961/30    | 221 MPa              | ISO 2039-1   |
| Poisson's ratio                        | 0.34                 |              |

### Thermal properties

|                                                |        |                |
|------------------------------------------------|--------|----------------|
| Melting temperature, 10 °C/min                 | 252 °C | ISO 11357-1/-3 |
| Glass transition temperature, 10 °C/min        | 90 °C  | ISO 11357-1/-3 |
| Temperature of deflection under load, 1.8 MPa  | 224 °C | ISO 75-1/-2    |
| Temperature of deflection under load, 0.45 MPa | 245 °C | ISO 75-1/-2    |
| Vicat softening temperature, 50 °C/h 50N       | 230 °C | ISO 306        |

# Rynite® 530 NC010

## THERMOPLASTIC POLYESTER RESIN

|                                                          |              |                |
|----------------------------------------------------------|--------------|----------------|
| Coeff. of linear therm. expansion, parallel, -40-23°C    | 22 E-6/K     | ISO 11359-1/-2 |
| Coefficient of linear thermal expansion (CLTE), parallel | 10 E-6/K     | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, parallel, 55-160°C    | 4 E-6/K      | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, normal, -40-23°C      | 67 E-6/K     | ISO 11359-1/-2 |
| Coefficient of linear thermal expansion (CLTE), normal   | 81 E-6/K     | ISO 11359-1/-2 |
| Coeff. of linear therm. expansion, normal, 55-160°C      | 107 E-6/K    | ISO 11359-1/-2 |
| Thermal conductivity, flow                               | 0.29 W/(m K) | ISO 22007-2    |
| Effective thermal diffusivity, flow                      | 1.3E-7 m²/s  | ISO 22007-4    |
| RTI, electrical, 0.75mm                                  | 140 °C       | UL 746B        |
| RTI, electrical, 1.5mm                                   | 140 °C       | UL 746B        |
| RTI, electrical, 3.0mm                                   | 140 °C       | UL 746B        |
| RTI, electrical, 6mm                                     | 140 °C       | UL 746B        |
| RTI, impact, 0.75mm                                      | 140 °C       | UL 746B        |
| RTI, impact, 1.5mm                                       | 140 °C       | UL 746B        |
| RTI, impact, 3.0mm                                       | 140 °C       | UL 746B        |
| RTI, impact, 6mm                                         | 140 °C       | UL 746B        |
| RTI, strength, 0.75mm                                    | 140 °C       | UL 746B        |
| RTI, strength, 1.5mm                                     | 140 °C       | UL 746B        |
| RTI, strength, 3.0mm                                     | 140 °C       | UL 746B        |
| RTI, strength, 6mm                                       | 140 °C       | UL 746B        |

### Flammability

|                                        |           |                      |
|----------------------------------------|-----------|----------------------|
| 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                       | 0.75 mm   | IEC 60695-11-10      |
| UL recognition                         | yes       | UL 94                |
| Oxygen index                           | 20 %      | ISO 4589-1/-2        |
| Glow Wire Flammability Index, 2.0mm    | 750 °C    | IEC 60695-2-12       |
| Glow Wire Flammability Index, 3.0mm    | 750 °C    | IEC 60695-2-12       |
| Glow Wire Ignition Temperature, 2.0mm  | 825 °C    | IEC 60695-2-13       |
| Glow Wire Ignition Temperature, 3.0mm  | 825 °C    | IEC 60695-2-13       |
| Glow Wire Temperature, No Flame, 1mm   | 750 °C    | IEC 60335-1          |
| Glow Wire Temperature, No Flame, 1.5mm | 750 °C    | IEC 60335-1          |
| Glow Wire Temperature, No Flame, 2mm   | 750 °C    | IEC 60335-1          |
| Glow Wire Temperature, No Flame, 3mm   | 825 °C    | IEC 60335-1          |
| FMVSS Class                            | B         | ISO 3795 (FMVSS 302) |
| Burning rate, Thickness 1 mm           | 38 mm/min | ISO 3795 (FMVSS 302) |

### Electrical properties

|                              |            |               |
|------------------------------|------------|---------------|
| Relative permittivity, 100Hz | 4.2        | IEC 62631-2-1 |
| Relative permittivity, 1MHz  | 3.8        | IEC 62631-2-1 |
| Dissipation factor, 100Hz    | 130 E-4    | IEC 62631-2-1 |
| Dissipation factor, 1MHz     | 70 E-4     | IEC 62631-2-1 |
| Volume resistivity           | 1E13 Ohm.m | IEC 62631-3-1 |
| Surface resistivity          | 1E14 Ohm   | IEC 62631-3-2 |

# Rynite® 530 NC010

## THERMOPLASTIC POLYESTER RESIN

|                                   |          |             |
|-----------------------------------|----------|-------------|
| Electric strength                 | 32 kV/mm | IEC 60243-1 |
| Comparative tracking index        | 250      | IEC 60112   |
| Comparative tracking index, 23 °C | 2 PLC    | UL 746A     |

### Physical/Other properties

|                                 |                        |                |
|---------------------------------|------------------------|----------------|
| Humidity absorption, 2mm        | 0.2 %                  | Sim. to ISO 62 |
| Water absorption, 2mm           | 0.7 %                  | Sim. to ISO 62 |
| Water absorption, Immersion 24h | 0.05 %                 | Sim. to ISO 62 |
| Density                         | 1560 kg/m <sup>3</sup> | ISO 1183       |

### VDA Properties

|                               |          |          |
|-------------------------------|----------|----------|
| Emission of organic compounds | 16 µgC/g | VDA 277  |
| Odour                         | 3 class  | VDA 270  |
| Fogging, G-value (condensate) | 0 mg     | ISO 6452 |

### Injection

|                                 |                        |
|---------------------------------|------------------------|
| Drying Recommended              | yes                    |
| Drying Temperature              | 120 °C                 |
| Drying Time, Dehumidified Dryer | 4 - 6 h                |
| Processing Moisture Content     | ≤0.02 <sup>[1]</sup> % |
| Melt Temperature Optimum        | 290 °C                 |
| Min. melt temperature           | 280 °C                 |
| Max. melt temperature           | 300 °C                 |
| Screw tangential speed          | ≤0.2 m/s               |
| Mold Temperature Optimum        | 110 °C                 |
| Min. mould temperature          | 95 °C                  |
| Max. mould temperature          | 125 <sup>[2]</sup> °C  |
| Hold pressure range             | ≥80 MPa                |
| Hold pressure time              | 4 s/mm                 |
| Back pressure                   | As low as possible     |
| Ejection temperature            | 200 °C                 |

[1]: At levels above 0.02%, strength and toughness will decrease, even though parts may not exhibit surface defects.

[2]: (6mm - 1mm thickness)

### Characteristics

|               |                    |
|---------------|--------------------|
| Processing    | Injection Moulding |
| Delivery form | Pellets            |
| Additives     | Release agent      |

### Additional information

|                   |                                                                                                                                                                                                                 |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Injection molding | When lower mold temperatures are used, the initial warpage and shrinkage will be lower, but the surface appearance will be poorer and the dimensional change may be greater when parts are subsequently heated. |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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## Automotive

### OEM

BMW

Stellantis - Chrysler

Stellantis - Chrysler

### STANDARD

GS93016-PET-GF30

MS.50103 / CPN-3009

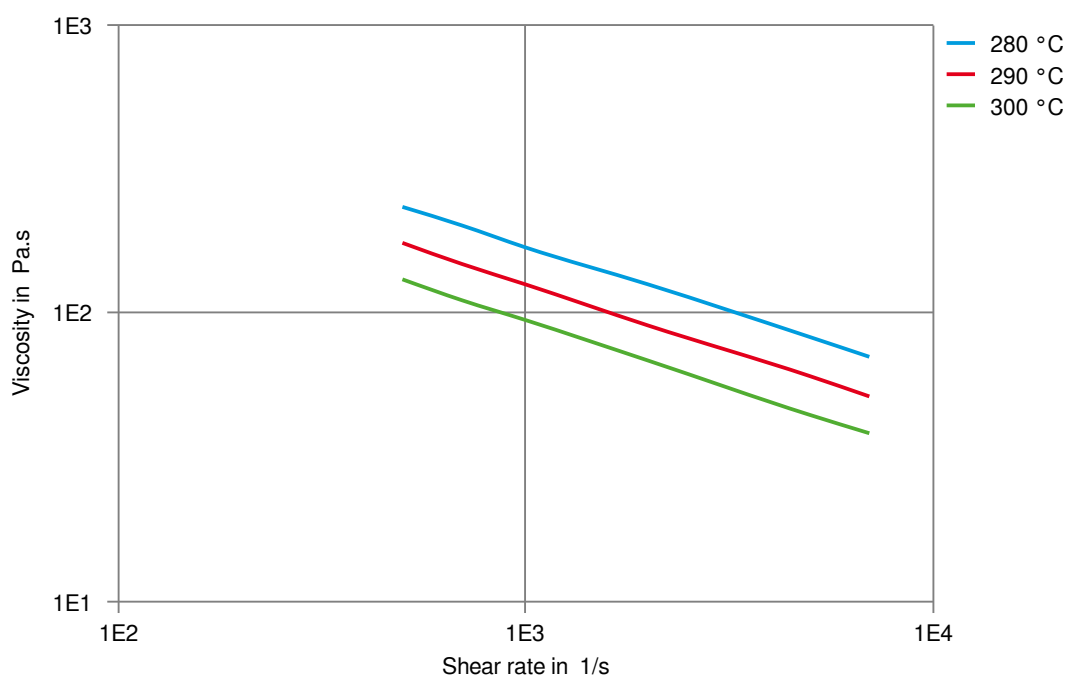
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### ADDITIONAL INFORMATION

Natural

Natural

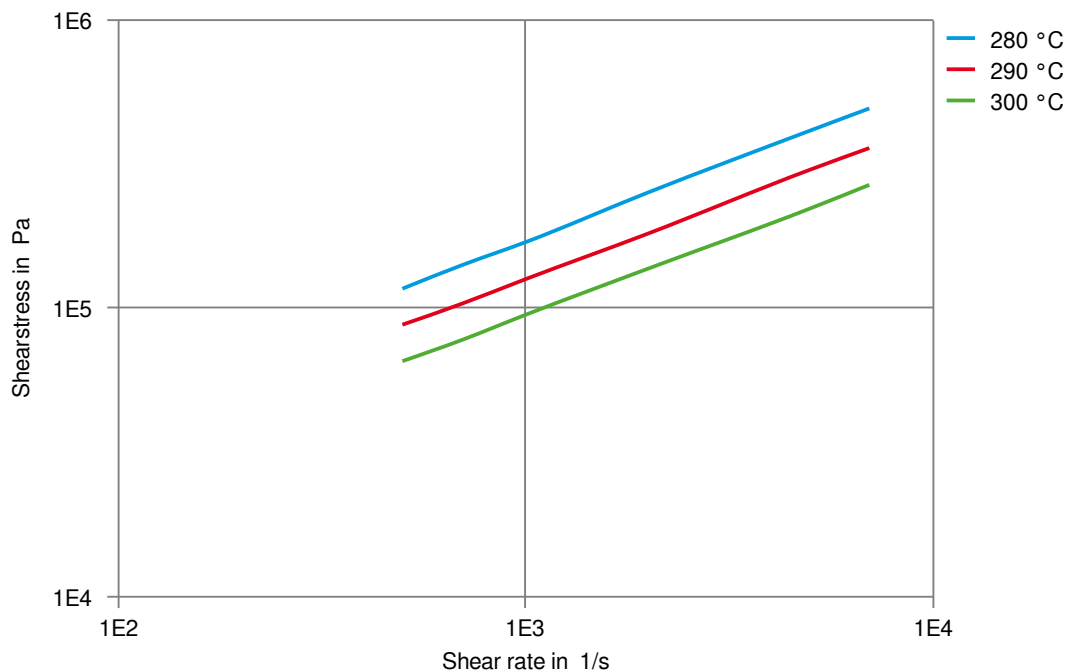
## Viscosity-shear rate



# Rynite® 530 NC010

THERMOPLASTIC POLYESTER RESIN

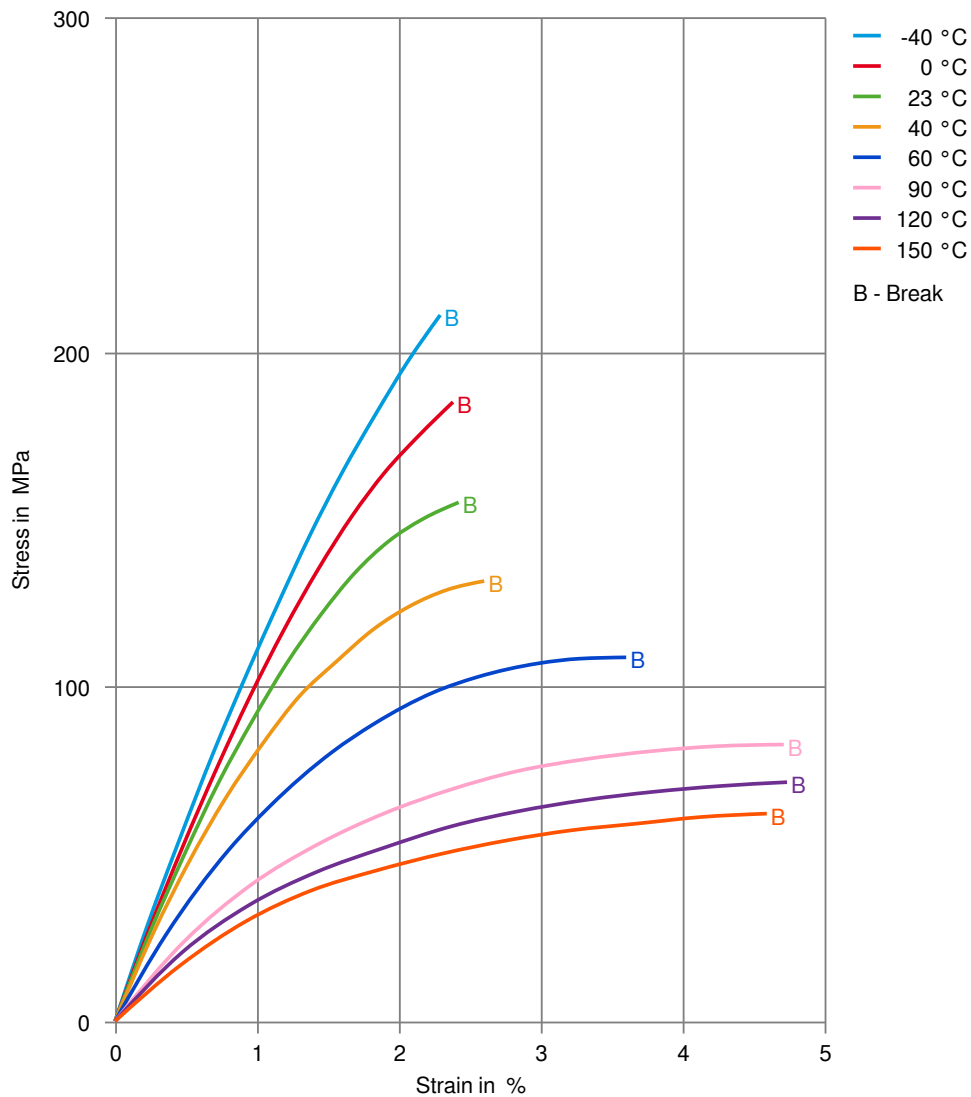
Shearstress-shear rate



# Rynite® 530 NC010

THERMOPLASTIC POLYESTER RESIN

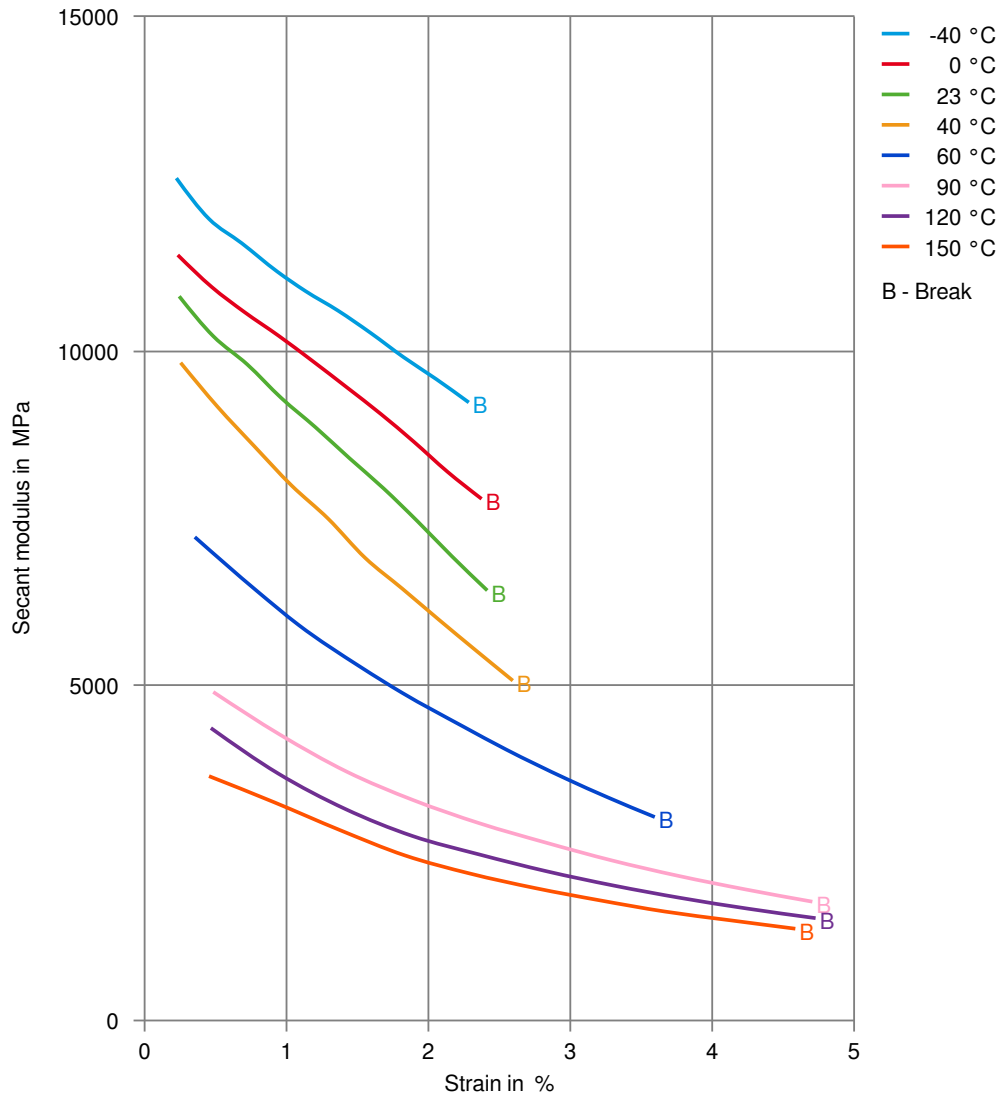
## Stress-strain



# Rynite® 530 NC010

THERMOPLASTIC POLYESTER RESIN

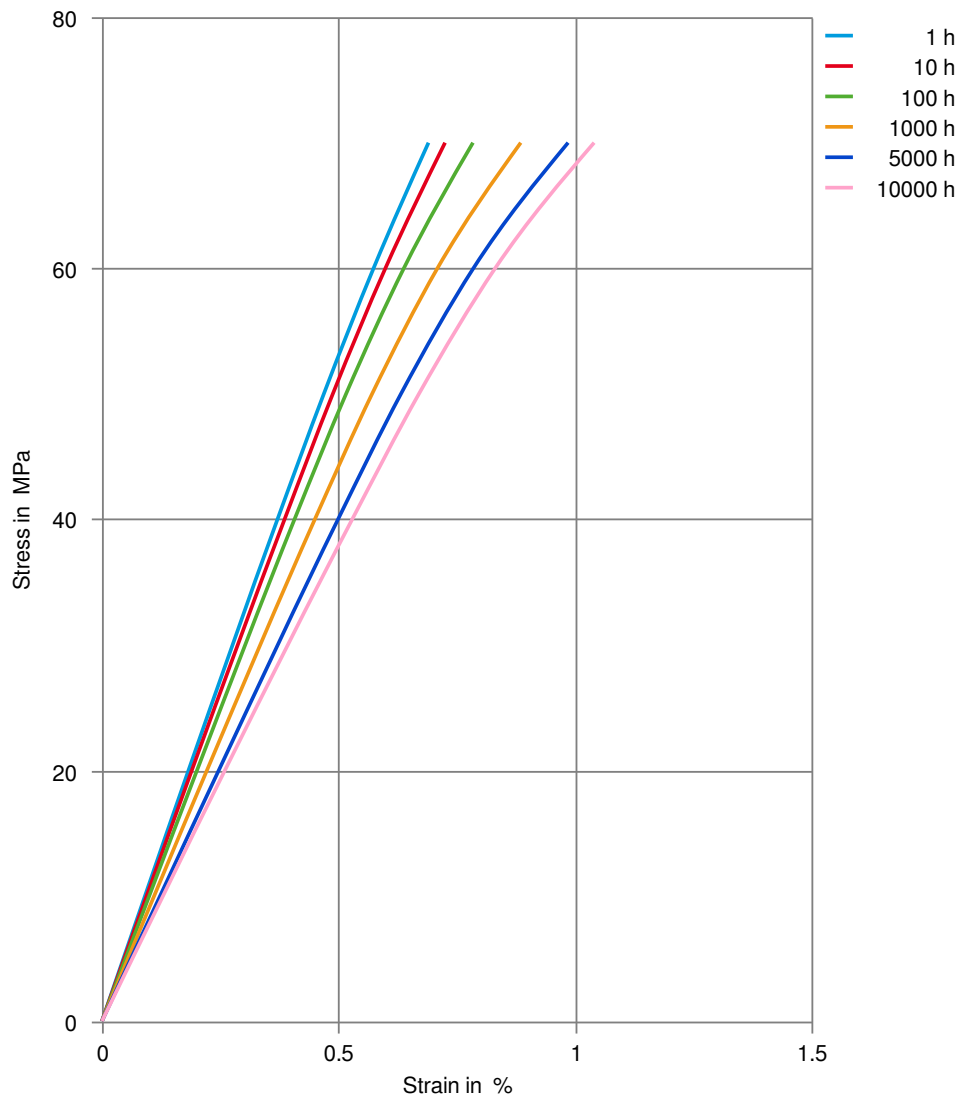
## Secant modulus-strain



# Rynite® 530 NC010

THERMOPLASTIC POLYESTER RESIN

Stress-strain (isochronous) 23°C

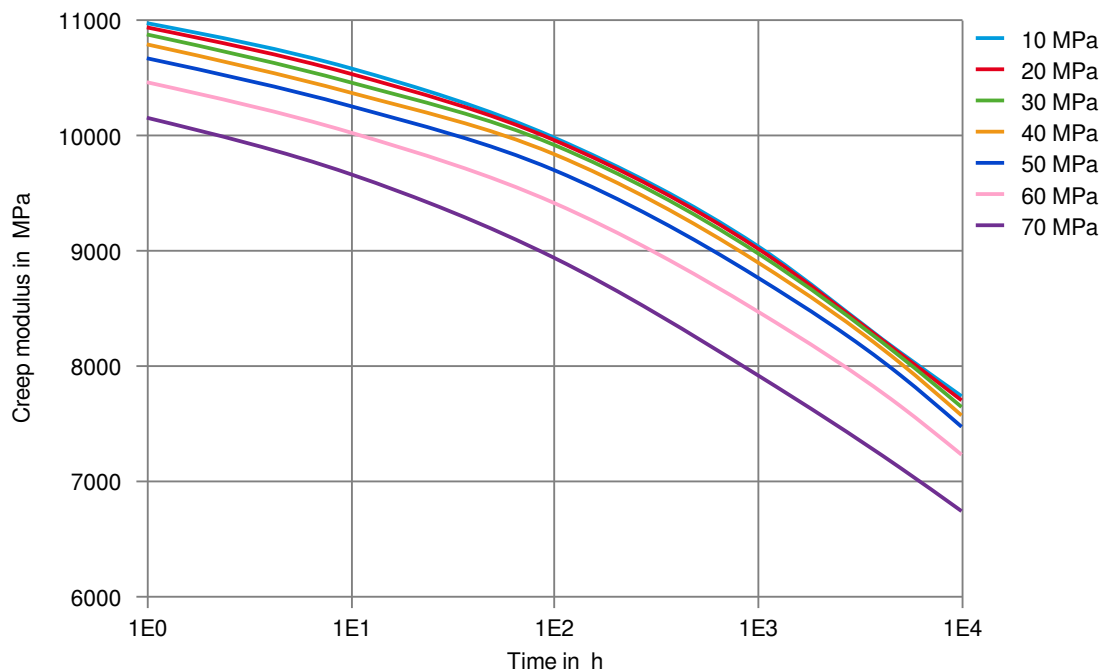




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THERMOPLASTIC POLYESTER RESIN

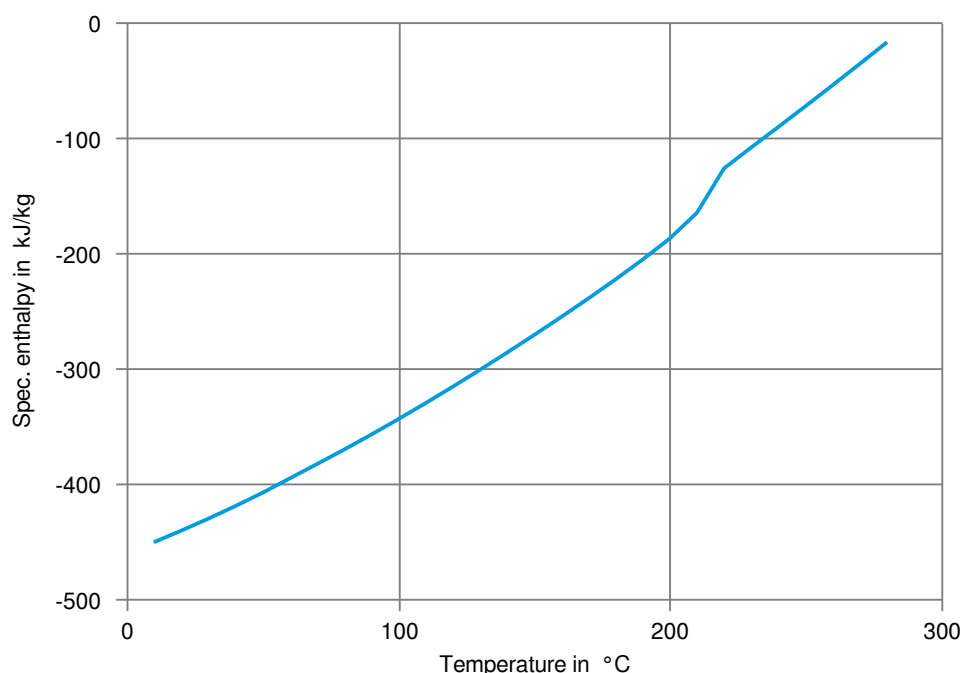
Creep modulus-time 23°C



# Rynite® 530 NC010

## THERMOPLASTIC POLYESTER RESIN

Spec. enthalpy/mass-temp. (DSC)



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Page: 10 of 10

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