Celanese
The chemistry inside innovation™

# ZYTEL® 74G50ARX ECO-R 311 BLK1

## NYLON RESIN

Zytel® 74G50ARX ECO-R 311 BLK1 incorporates 30% of post-industrial recycled content by weight in the finished product. It is a 50% Glass Reinforced, Heat Stabilized, Polyamide 66 designed for Automotive industry.

## Product information

| | | | |
|---|---|---|---|
| Resin Identification | (PA66+PA6)-GF50(R30) | | ISO 1043 |
| Part Marking Code | >(PA66+PA6)-GF50(R30)< | | ISO 11469 |
| Continuous Service Temperature | 130 | °C | IEC 60216-1 |

## Rheological properties

| | | | |
|---|---|---|---|
| Moulding shrinkage range, parallel | 0.1 - 0.5 | % | ISO 294-4, 2577 |
| Moulding shrinkage range, normal | 0.5 - 0.9 | % | ISO 294-4, 2577 |

## Typical mechanical properties

| | dry/cond. | | |
|---|---|---|---|
| Tensile modulus | 16300 / 12000 | MPa | ISO 527-1/-2 |
| Tensile stress at break, 5mm/min | 200 / 140 | MPa | ISO 527-1/-2 |
| Tensile strain at break, 5mm/min | 2.3 / 3.3 | % | ISO 527-1/-2 |
| Flexural modulus | 14500 / - | MPa | ISO 178 |
| Flexural strength | 300 / - | MPa | ISO 178 |
| Charpy impact strength, 23°C | 75 / 80 | kJ/m² | ISO 179/1eU |
| Charpy impact strength, -30°C | 45 / - | kJ/m² | ISO 179/1eU |
| Charpy notched impact strength, 23°C | 14 / 16 | kJ/m² | ISO 179/1eA |
| Charpy notched impact strength, -30°C | 8.5 / - | kJ/m² | ISO 179/1eA |
| Ball indentation hardness, H 961/30 | 230 / - | MPa | ISO 2039-1 |
| Poisson's ratio | 0.33 / 0.33[C] | | |

[C]: Calculated

## Thermal properties

| | dry/cond. | | |
|---|---|---|---|
| Melting temperature, 10°C/min | 260 / * | °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 | 250 / * | °C | ISO 75-1/-2 |
| Coefficient of linear thermal expansion (CLTE), parallel | 20 / * | E-6/K | ISO 11359-1/-2 |
| Coefficient of linear thermal expansion (CLTE), normal | 80 / * | E-6/K | ISO 11359-1/-2 |

## Physical/Other properties

| | dry/cond. | | |
|---|---|---|---|
| Humidity absorption, 2mm | 1.2 / * | % | Sim. to ISO 62 |
| Water absorption, 2mm | 4.1 / * | % | Sim. to ISO 62 |
| Density | 1560 / - | kg/m³ | ISO 1183 |

## Injection

| | | |
|---|---|---|
| Drying Recommended | yes | |
| Drying Temperature | 80 | °C |
| Drying Time, Dehumidified Dryer | 2 - 4 | h |
| Processing Moisture Content | ≤0.15 | % |

# ZYTEL® 74G50ARX ECO-R 311 BLK1

## NYLON RESIN

| | | |
|---|---|---|
| Melt Temperature Optimum | 285 | °C |
| Min. melt temperature | 275 | °C |
| Max. melt temperature | 295 | °C |
| Screw tangential speed | ≤0.2 | m/s |
| Mold Temperature Optimum | 100 | °C |
| Min. mould temperature | 70 | °C |
| Max. mould temperature | 120 | °C |

## Characteristics

| | |
|---|---|
| Processing | Injection Moulding |
| Additives | Contains Recycle |
| Special characteristics | Heat stabilised or stable to heat |

## Additional information

Injection molding

### Preprocessing

PA materials, stocked in a moisture-proof packaging, can be processed without drying; however, it is always recommended drying the product that comes from a large package (e.g. Octabin). The moisture content suggested for the injection molding process should be lower than 0.15%, according to the grade and to the molded part characteristics. The materials containing flame retardants should have moisture content below 0.10%. Red phosphorous containing grades must always be dried below 0.08%. The drying time depends on the moisture content and the drying conditions. Typically, 4-8 hours at 80-90°C using dehumidified air (dew point of -20°C) are suitable conditions for a starting moisture content of 0.20%-0.40%.

### Processing

The following conditions apply to a standard injection molding process. Machine temperatures: barrel 265-290°C (PA66), 235-270°C (PA6), nozzle and hot runners up to 300°C (up to 290°C products with flame retardants). Mold temperatures: 60-80°C, (80-100°C highly reinforced grades). Back pressure: typically, 5-10 bar (hydraulic pressure). Temperatures exceeding 300°C and long residence time could lead to additives degradation and brittleness of the material. In case of gas generation in the melt, please verify moisture content and processing temperatures. Usage of regrind is possible depending on the molded part characteristics. For further details, please refer to the document 'Instructions for injection molding' or contact our technical support team.

### Postprocessing

PA materials reach their final performance with a water content of about 1.5 to 3.5% by weight, depending on the type. This percentage corresponds to the point of equilibrium between the rates of absorption and desorption of moisture. After molding, in favorable environmental conditions, a part can quickly absorbs moisture up to 0.5-1.0%, while the equilibrium will be reached during its life. A conditioning treatment can accelerate further the initial water absorption of the

# ZYTEL® 74G50ARX ECO-R 311 BLK1

NYLON RESIN

molded parts. Conditioning is usually carried out in hot and humid environment (for example 50 °C, 100% RH), inside climatic chambers. Slight dimensional variations (increase in volume due to the water absorbed) must be considered, especially in unfilled grades. Post-treatments of parts may also include the annealing (60-80 °C in oven, up to four hours). This procedure can be useful to relax any internal stresses.

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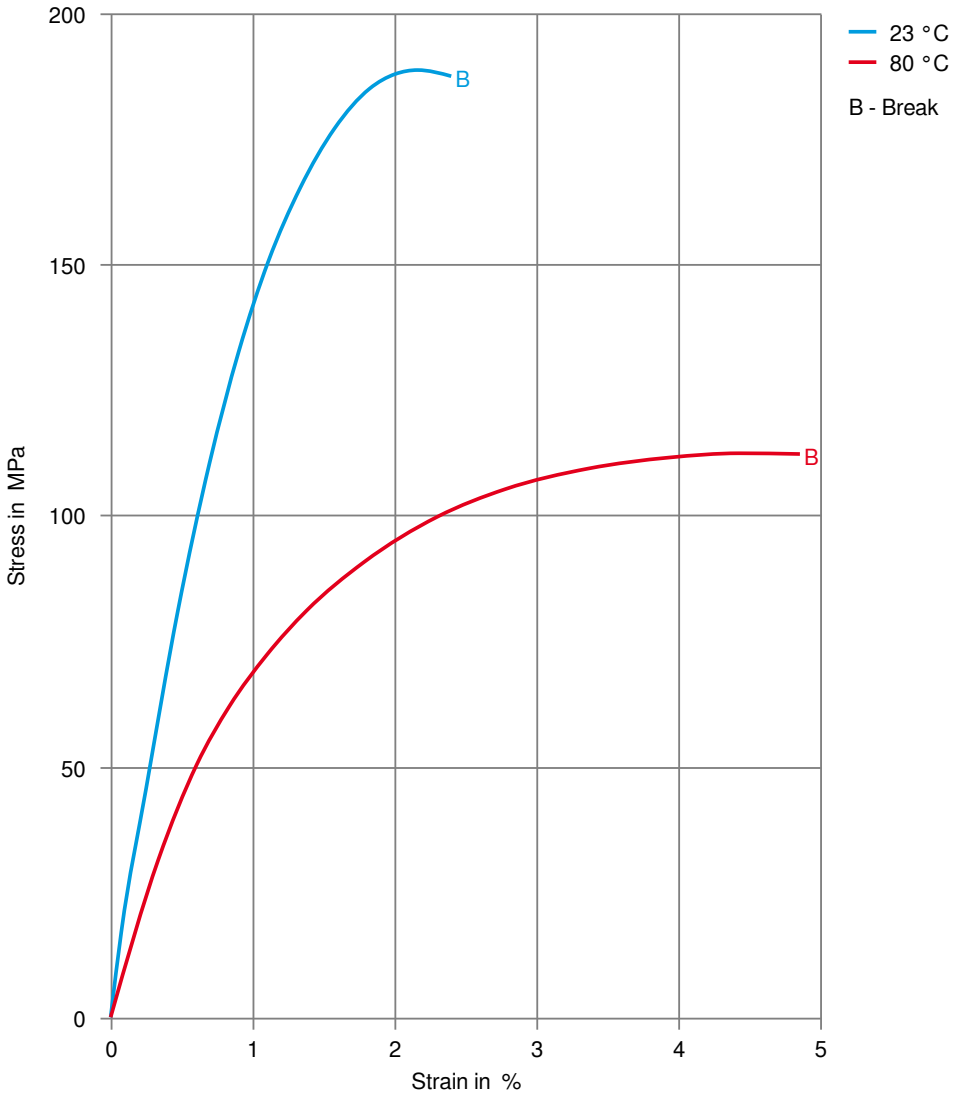
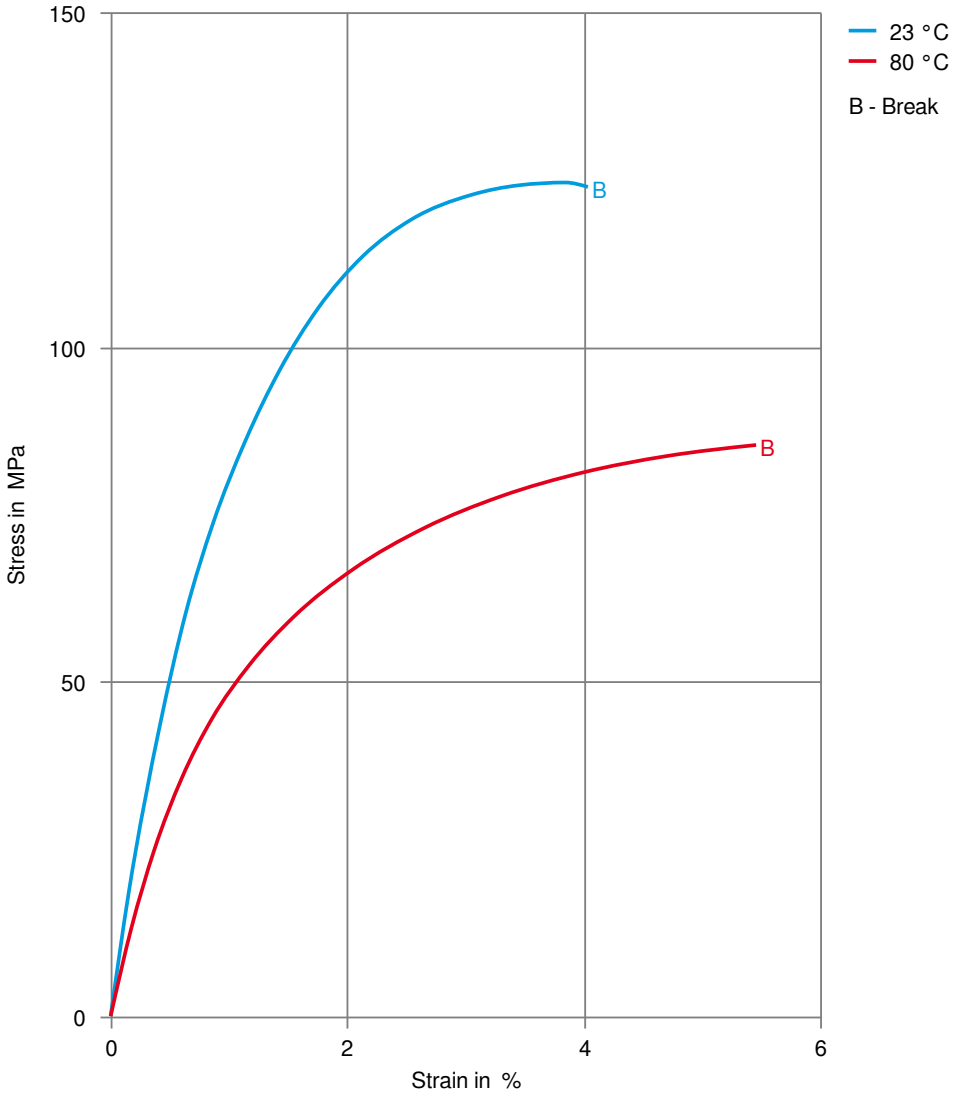
## Stress-strain (dry)



# ZYTEL® 74G50ARX ECO-R 311 BLK1

NYLON RESIN

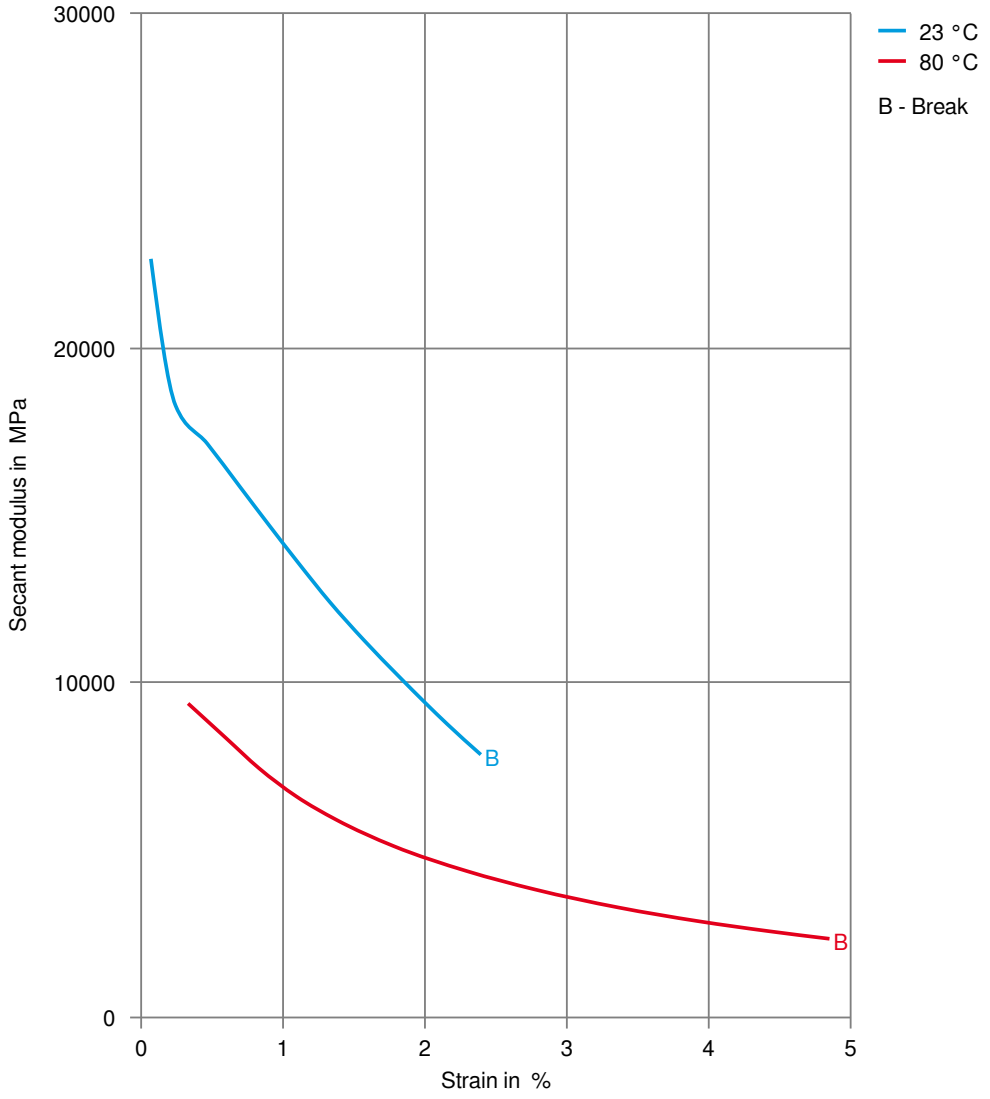
## Stress-strain (cond.)



# ZYTEL® 74G50ARX ECO-R 311 BLK1

NYLON RESIN

## Secant modulus-strain (dry)



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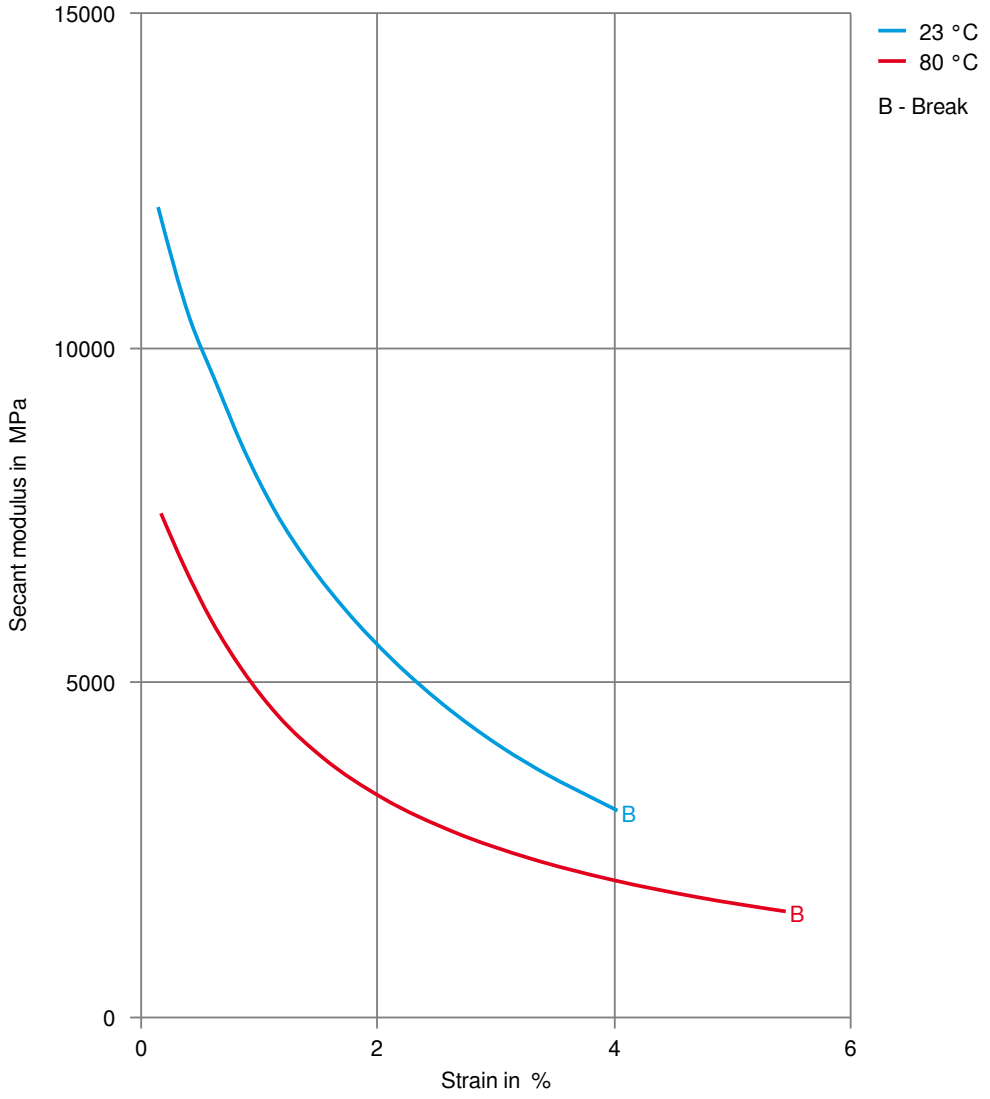
# ZYTEL® 74G50ARX ECO-R 311 BLK1

NYLON RESIN

## Secant modulus-strain (cond.)



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