

# ZYTEL® 73G15HSL ECO-R 311 BLK1 (PRELIMINARY)

## NYLON RESIN

Zytel® 73G15HSL ECO-R 311 BLK1 incorporates 30% of post-industrial recycled content by weight in the finished product. It is a 15% Glass Reinforced, Heat Stabilized, Polyamide 6 designed for Automotive parts requiring high thermal resistance, Household appliances and Electrical devices.

### Product information

Resin Identification	PA6-GF15(R30)	ISO 1043
Part Marking Code	>PA6-GF15(R30)<	ISO 11469
Continuous Service Temperature	130 °C	IEC 60216-1

### Rheological properties

Moulding shrinkage range, parallel	0.4 - 0.8 %	ISO 294-4, 2577
Moulding shrinkage range, normal	0.8 - 1.2 %	ISO 294-4, 2577

### Typical mechanical properties

	dry/cond.		
Tensile modulus	6000/3000	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	115/60	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	3.5/10	%	ISO 527-1/-2
Flexural modulus	5500/-	MPa	ISO 178
Flexural strength	180/-	MPa	ISO 178
Charpy impact strength, 23°C	35/110	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength, -30°C	30/40	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, 23°C	3.5/8.5	kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -30°C	3/3	kJ/m <sup>2</sup>	ISO 179/1eA
Poisson's ratio	0.35/0.37 <sup>[C]</sup>		

[C]: Calculated

### Thermal properties

	dry/cond.		
Melting temperature, 10°C/min	220/*	°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	185/*	°C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	215/*	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N	205/*	°C	ISO 306

### Physical/Other properties

	dry/cond.		
Humidity absorption, 2mm	2.3/*	%	Sim. to ISO 62
Water absorption, 2mm	7.8/*	%	Sim. to ISO 62
Density	1240/-	kg/m <sup>3</sup>	ISO 1183

### Injection

Drying Recommended	yes
Drying Temperature	80 °C
Drying Time, Dehumidified Dryer	2 - 4 h
Processing Moisture Content	≤0.15 %
Melt Temperature Optimum	250 °C
Min. melt temperature	235 °C

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Max. melt temperature	280 °C
Screw tangential speed	≤0.2 m/s
Mold Temperature Optimum	80 °C
Min. mould temperature	60 °C
Max. mould temperature	120 °C

### Characteristics

Processing	Injection Moulding
Delivery form	Granules
Additives	Contains Recycle
Special characteristics	Heat stabilised or stable to heat, Sustainable

### 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 absorb 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

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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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## Automotive

### OEM

VW Group

### STANDARD

VW 50125

### ADDITIONAL INFORMATION

\*Best Fitting Grade To PA6-4, Not Officially Approved

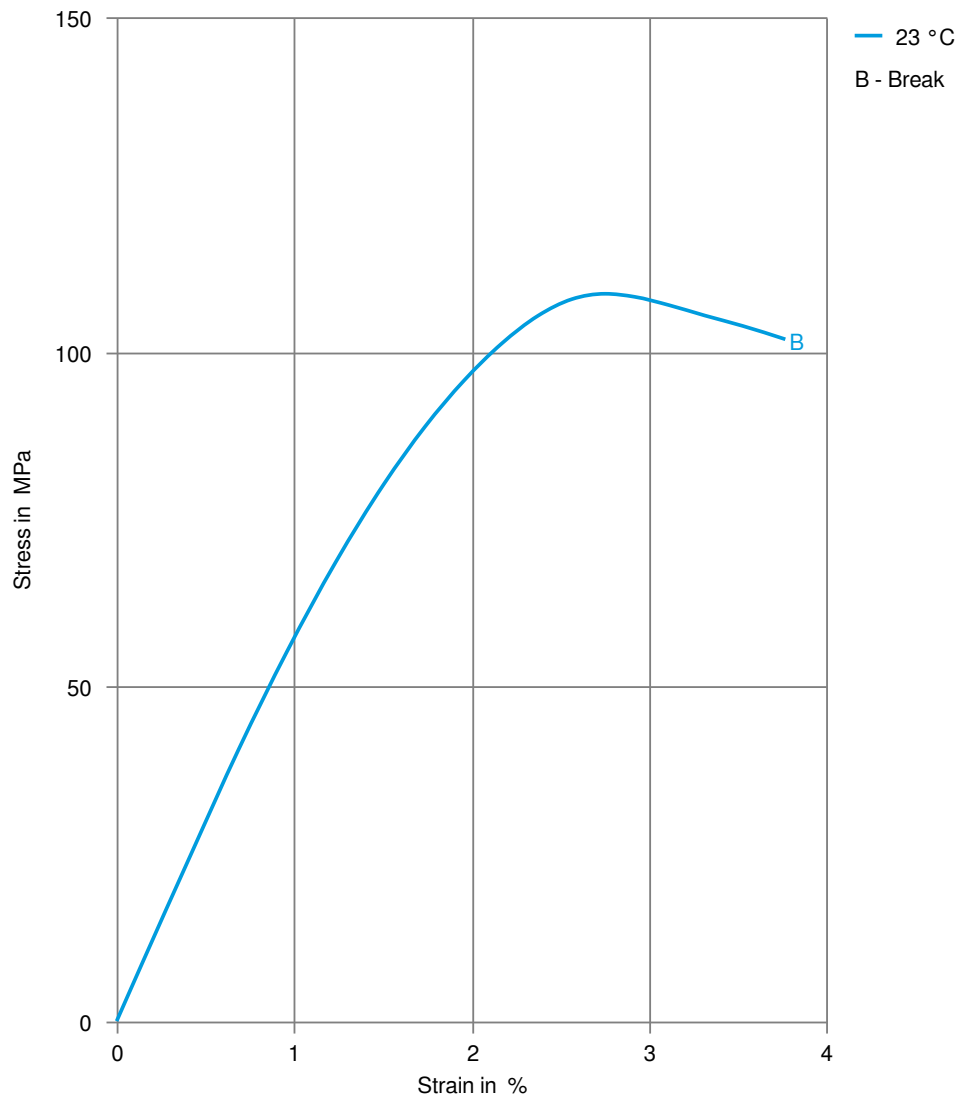
VW Group

VW 50134

\*Best Fitting Grade To PA6-3-A, Not Officially Approved

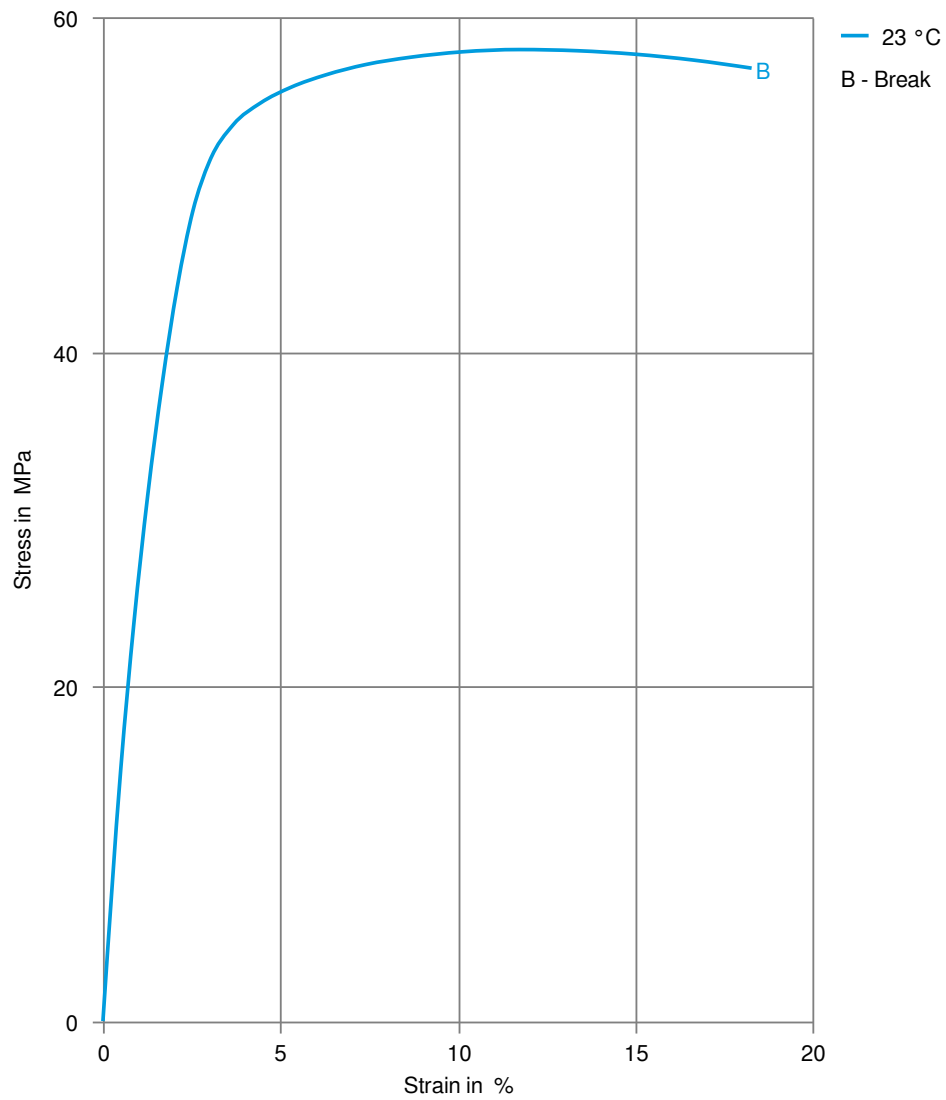
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NYLON RESIN

Stress-strain (dry)



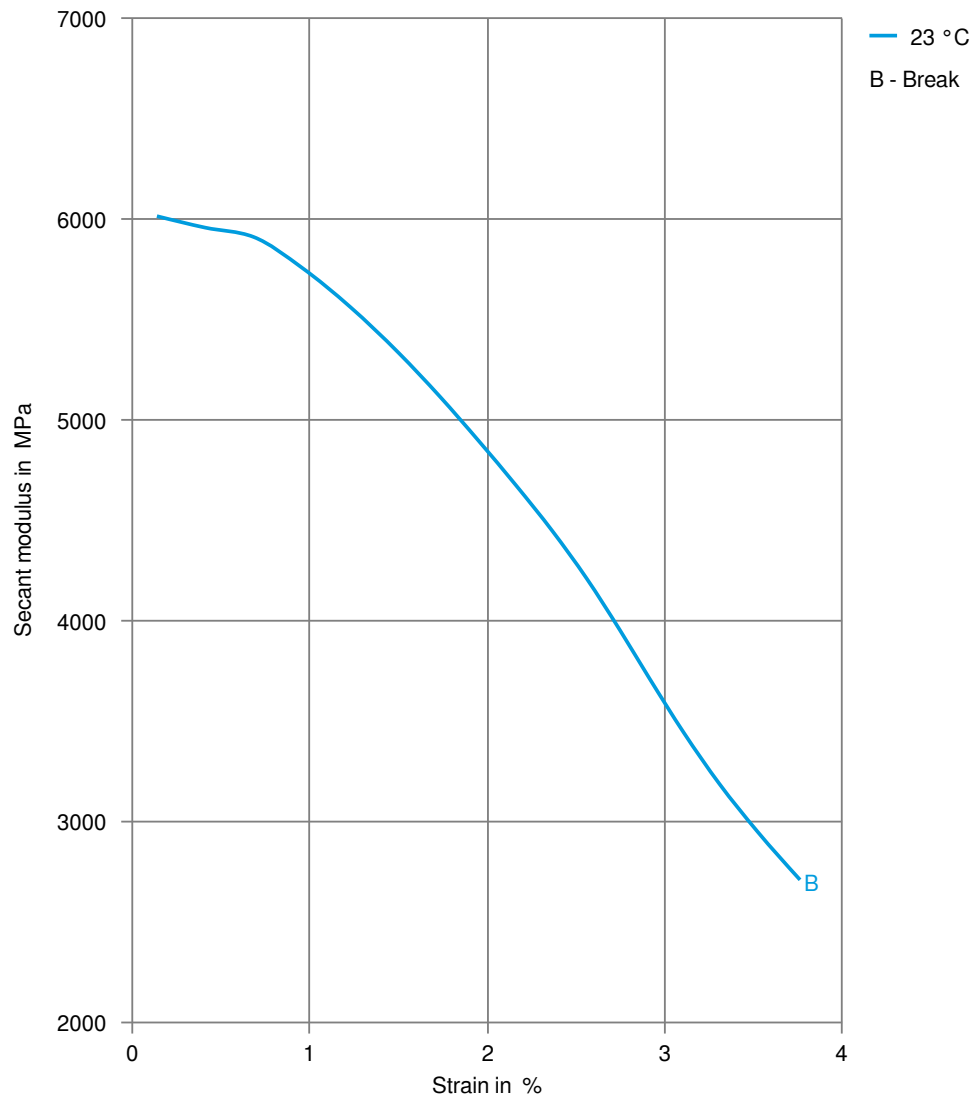
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NYLON RESIN

Stress-strain (cond.)



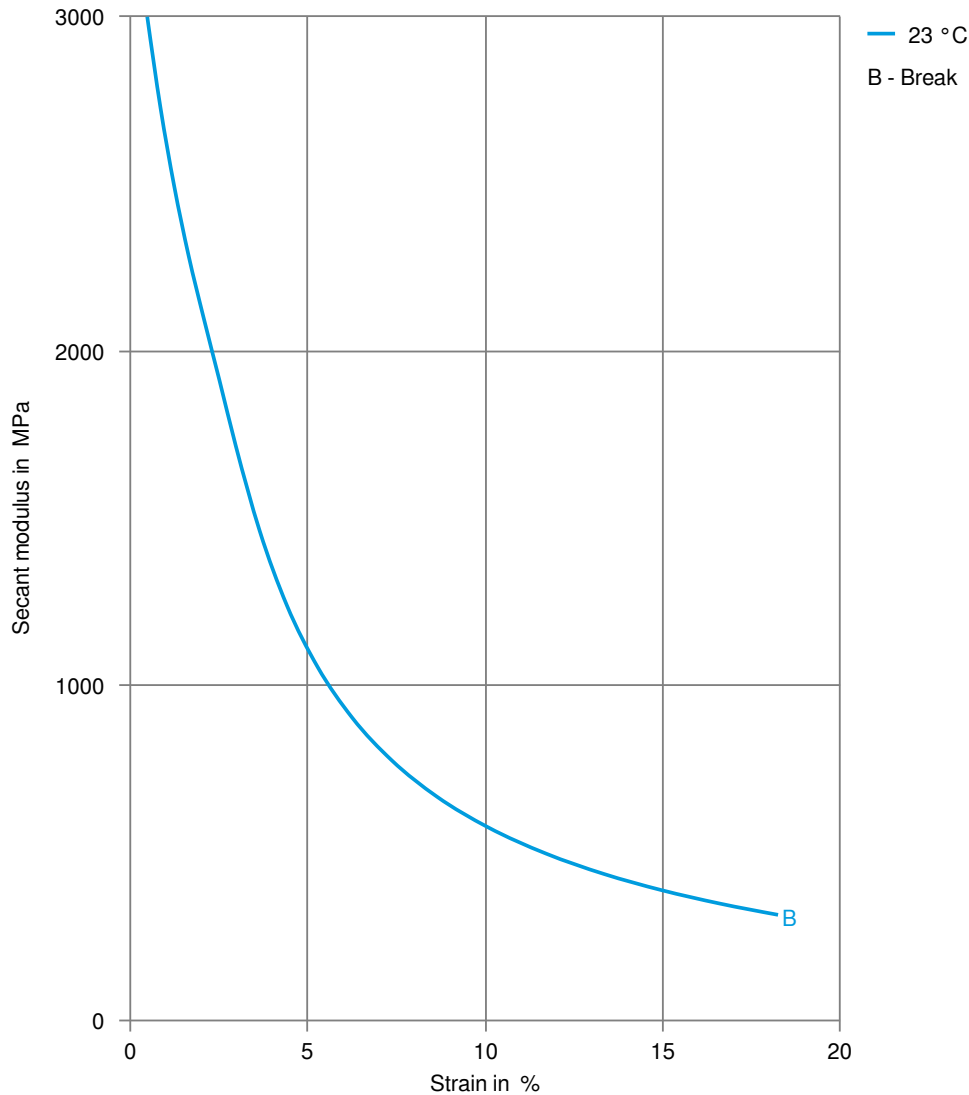
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NYLON RESIN

Secant modulus-strain (dry)



# ZYTEL® 73G15HSL ECO-R 311 BLK1 (PRELIMINARY) NYLON RESIN

## Secant modulus-strain (cond.)



Printed: 2024-11-08

Page: 7 of 7

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The above data are preliminary and are subject to change as additional data are developed on subsequent lots.

**NOTICE TO USERS:** Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colourants or other additives may cause significant variations in data values. Properties of moulded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design, processing conditions and environmental exposure. Other than those products expressly identified as medical grade (including by MT® product designation or otherwise), Celanese's products are not intended for use in medical or dental implants. Regardless of any such product designation, any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use. To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication. Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards. We strongly recommend that users seek and adhere to the manufacturer's current instructions for handling each material they use, and entrust the handling of such material to adequately trained personnel only. Please call the telephone numbers listed for additional technical information. Call Customer Services for the appropriate Materials Safety Data Sheets (MSDS) before attempting to process our products.

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