

Connecting**Chemistry**



POLYMERS DACH

Car Seat Shell in
NYLAFORCE® B 50 Z SCHWARZ

Product Information

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Outstanding toughness coupled with a very high level of strength and stiffness - these are the characteristic properties of the NYLAFORCE® B 50 Z compounds produced by the feed-up-process. This material was developed especially for car seat shells.

In this application, particular requirements are placed on the dimensional stability, fracture behaviour and surface finish of the material, since the parts are not subsequently painted or coated.

Seat backs are put through extreme loading tests. In addition to frontal and rear crash tests, they are also required to pass the critical "protection against shifting cargo" test. This simulates the impact of objects in the back of the car hitting the front seats. All the forces that are generated in a crash must be absorbed by the material in the seat shell or be conducted into the bodywork via the bolted connections, since the seat shells do not contain any additional metal struts.

NYLAFORCE® B 50 Z emerged as the clear winner in the material selection process, beating all the other thermoplastics, including long glass fibre reinforced polyamides and

semi-aromatic polymers with a high level of reinforcement. In addition, NYLAFORCE® B 50 Z is noted for its simple processing and excellent component surface.

NYLAFORCE® Features

- High-glass fiber reinforced construction materials based on PA 6 and PA 66
- Predestined for the substitution of metals
- For technical applications with the highest demands on strength and stiffness
- Outstanding physical and mechanical properties
- No PA 6 / PA 66 on the market with comparable mechanical values
- High tensile modulus and thus high dimensional stability
- High tensile strength with a still very high degree of elasticity
- Outstanding dimensional stability and low warpage
- Depending on the tool geometry, significant cycle time reduction possible
- Better processing properties than partially aromatic polyamides
- Also suitable for extrusion
- Universal application profile



Physical and mechanical Properties

PROPERTY	STANDARD	UNIT	NYLAFORCE® B 50 Z SCHWARZ
Glass fibre reinforcement	–	%	50
Density	ISO 1183	g/cm ³	1.56
Tensile strength dry 23 °C	ISO 527	MPa	220
Tensile strength conditioned 23 °C	ISO 527 ISO 1110	MPa	150
Elongation at break dry 23 °C	ISO 527	%	2.6
Elongation at break conditioned 23 °C	ISO 527 ISO 1110	%	5
Tensile modulus dry 23 °C	ISO 527	MPa	16 500
Tensile modulus conditioned 23 °C	ISO 527 ISO 1110	MPa	11 500
Charpy impact strength unnotched dry 23 °C	ISO 179/1eU	kJ/m ²	85
Charpy impact strength unnotched conditioned 23 °C	ISO 179/1eU ISO 1110	kJ/m ²	86
Charpy impact strength notched dry 23 °C	ISO 179/1eA	kJ/m ²	14
Charpy impact strength notched conditioned 23 °C	ISO 179/1eA ISO 1110	kJ/m ²	26
Melting temperature	ISO 3146 (10K/min)	°C	221
Heat deflection temperature HDT/A	ISO 75	°C	>200
Surface resistivity	DIN IEC 60093	Ohm	>10 ¹²
Volume resistivity	DIN IEC 60093	Ohm*m	>10 ¹²
Flammability (3 mm)	UL 94	–	HB
Humidity absorption	similar to ISO 62	%	1.5
Water absorption	similar to ISO 62	%	4.8
Moulding shrinkage	ISO 294 ¹⁾	%	0.1 - 0.5

1) Internal test method in accordance with ISO 294 (test specimen 60 mm x 60 mm x 2 mm).

Processing Advice

NYLAFORCE®

can be processed on most customary types of injection moulding machine. The same processing conditions as for glass fibre reinforced polyamides can fundamentally be employed. Due to the high processing temperatures and abrasive-ness of reinforced materials, the plasticising unit and hot runner system should be made of wear-resistant steel. Preference should be given to open nozzles over shut-off nozzles. To achieve a homogeneous melt temperature and a constant part geometry, use should be made of suitable plasticising screws with a non-return valve. The required shot size should be between 10 % and 70 % of the machine's rated capacity.

Material drying

NYLAFORCE® is supplied in moisture-proof containers, with a maximum moisture content of 0.2 %, and can be directly processed in this state. We recommend that it be stored in a dry room. In order to achieve an optimum part quality and avoid processing problems due to moisture that has been absorbed in the meantime, we recommend that the material be pre-dried until it has a residual moisture content of approx. 0.1 %. Drying should be performed in a dry-air dryer (dew point less than - 20 °C) or in a vacuum drying cupboard at 80 °C to 90 °C for 4 to 12 hours. Circulating-air dryers are not suitable for NYLAFORCE®. Once it has been dried, the material must be protected against renewed absorption of moisture from the environment.

Recommended Machine Parameters and Tool Temperature

PARAMETER	RANGE	RECOMMENDATION
Melt temperature	250 °C to 320 °C	290 °C
Dosing speed	10 m/min. to 20 m/min.	15 m/min.
Back pressure	20 bar to 80 bar	40 bar
Filling pressure	800 bar to 1500 bar	1200 bar
Injection speed	high	high
Tool temperature	80 °C to 140 °C	140 °C

The specified values are given as a guide only. The values actually required will be a function of the geometry and the desired quality of the injection moulded part, in particular.

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