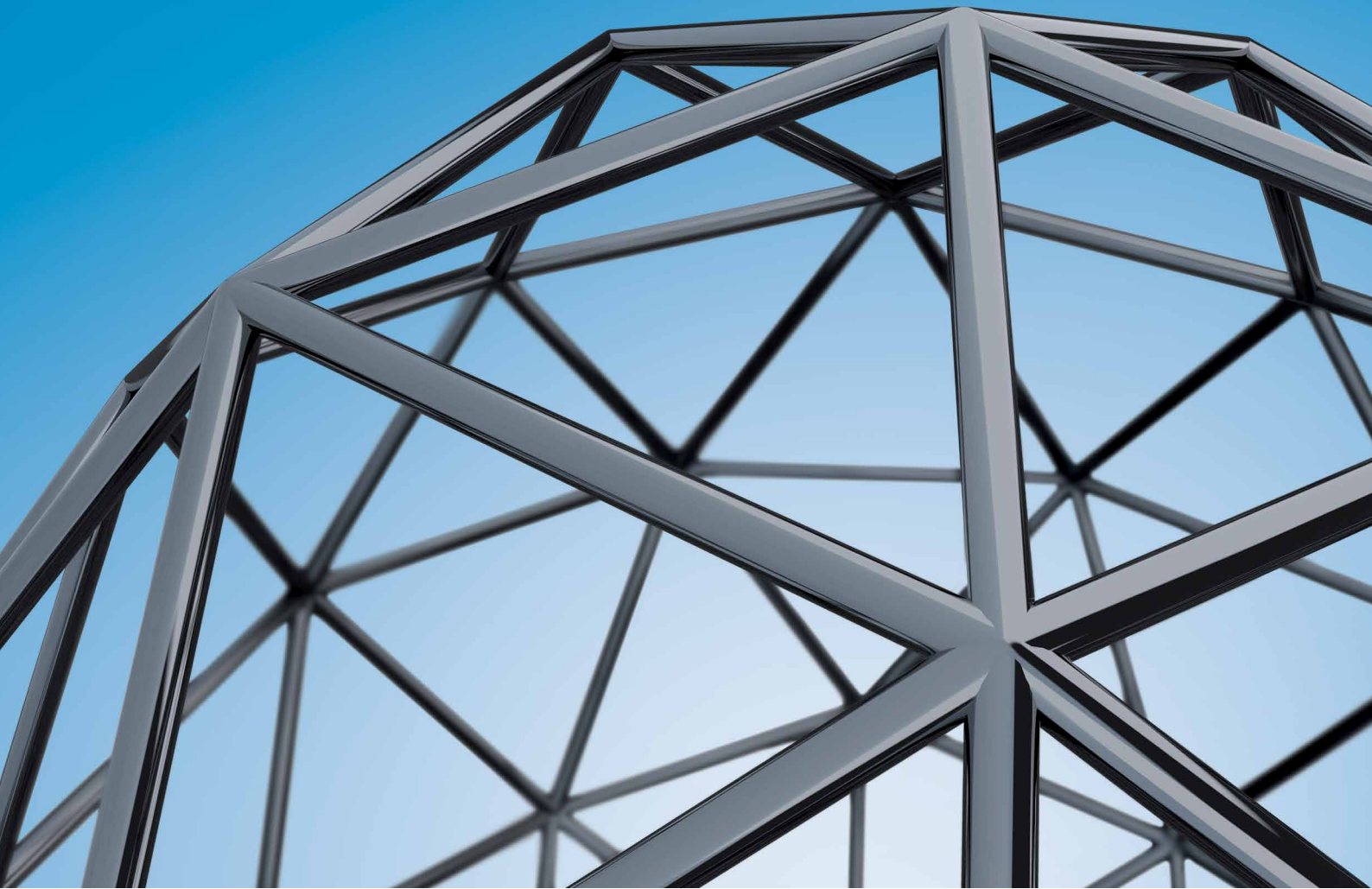


Highly reinforced compounds – For the highest requirements



AKRO-PLASTIC 
Think Polyamide

AKRO-PLASTIC GmbH
Member of the Feddersen Group

Highly reinforced plastics

Highly reinforced plastics are steadily gaining importance, particularly polyamides. They are used primarily in the area of metal substitutes, helping to reduce weight. Component designs are becoming increasingly more delicate, and OEMs are requiring thinner wall thicknesses with the same strengths and lower density.

Notable in this context are the particularly high strengths and stiffnesses at reduced density compared with metals. Owing to extremely high stiffnesses of up to 16,000 MPa in our AKROMID® A28 GF 50 (PA 6.6 GF 50) as well as high tensi-

le strengths of 250 MPa, these types are well suited for use as alternatives to metals such as aluminium or zinc. In addition to the significant weight advantage of 1 g/cm³ to 5 g/cm³, the manufacturing method for polyamides is also significantly easier and involves less energy expenditure.

AKRO-PLASTIC GmbH also offers highly reinforced compounds in the area of PPA 6.6 + 6I / 6T and PPA alongside highly reinforced PA 6.6 types. Through our close partnership with the extruder manufacturer FEDDEM GmbH & Co. KG, we have an established machine tech-

nology developed over a number of years, making it possible for us to produce highly reinforced products within proven, extremely close tolerances.

Besides the high batch consistency, our products also exhibit higher strengths than those of our market competitors (see product table below). Thus the same strengths can be realised with a smaller proportion of glass fibres. This protects the machine technology and reduces wear.

Typical values for natural color material 23 °C	Test specification	Test method	Unit	A28 GF 50 9 black (5030)	Competitor 1	Competitor 2
Mechanical properties				d.a.m.	d.a.m.	d.a.m.
Tensile modulus	1 mm/min	ISO 527-2	MPa	16,000	16,000	16,000
Tensile stress at break	5 mm/min	ISO 527-2	MPa	250	230	230
Elongation at break	5 mm/min	ISO 527-2	%	3	2,6	2,6
Flexural modulus	2 mm/min	ISO 178	MPa	15,200	14,000	15,000
Flexural stress	2 mm/min	ISO 178	MPa	380	360	360
Charpy impact strength	23 °C	ISO 179-1/1eU	kJ/m ²	100	95	94
Charpy impact strength	-30 °C	ISO 179-1/1eU	kJ/m ²	80	85	80
Charpy notched impact strength	23 °C	ISO 179-1/1eA	kJ/m ²	19	15	16
Charpy notched impact strength	-30 °C	ISO 179-1/1eA	kJ/m ²	17	12	15
Thermal properties						
Melting point	DSC, 10 K/min	DIN EN 11357-1	°C	262	261	260
Heat distortion temperat., HDT/A	1.8 MPa	ISO 75	°C	260	250	256
General properties						
Density	23 °C	ISO 1183	g/cm ³	1.57	1.57	1.57
Reinforcement content		ISO 1172	%	50	50	50
Inspection certificate tolerances			%	50 + 1.5	50 + 2.5	50 + 2.0
Processing						
Flowability	Flowspiral ¹ 1 mm	AKRO	mm	220	180	180
Flowability	Flowspiral ¹ 2 mm	AKRO	mm	440	380	400

¹ = mould temperature: 100 °C, mass temperature: 320 °C, injection pressure: 750 bar, cross section of flow spiral: 7 mm x 3.5 mm
 "dry as moulded" test values = residual moisture content <0.1 %



In partnership with its sister company, the extruder manufacturer FEDDEM GmbH & Co. KG, AKRO-PLASTIC GmbH has developed a technology that consistently provides the same high quality of the products, irrespective of the production site. This system, called ICX® Technology, consists of identical machine and peripheral technology and uniform processes. ICX® Technology is used at all our production sites worldwide and, using raw materials of the same quality along with our certified quality management and in-house test laboratory,

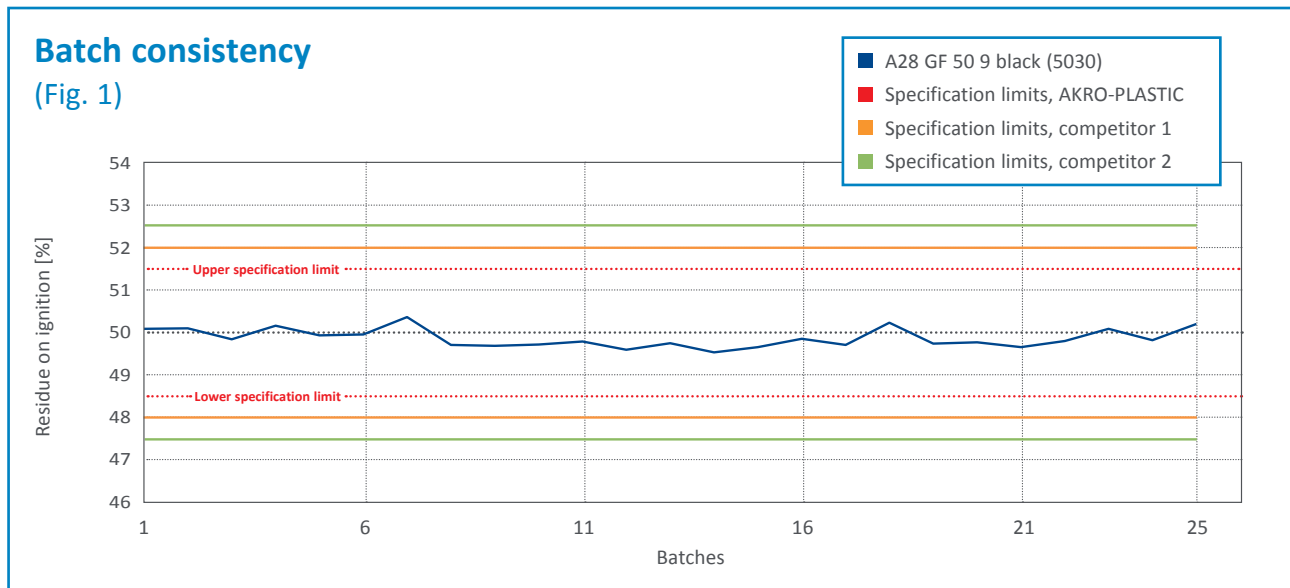
ensures the unparalleled quality of our products.

Figure 1 shows the glass fibre distribution in an AKROMID® A28 GF 50 9 black (5030) over 25 batches. The average of these 25 batches is 49.87 %. The product specification is currently ±1.5 %, whereby only a range of ±0.5 % is required in reality. In comparison, market competitors indicate ±2 % or ±2.5 % for their inspection certificate tolerances.

Many details must be complied with in order to continually manufacture

at this precision in a cost-effective manner:

- Gravimetric dosing systems
- Raw material silos in a dry-air atmosphere
- Screws without kneading blocks
- Low-wear extruder steels (HIP)
- Preventive maintenance
- Incoming goods inspection
- Top-notch raw materials



Working methods and maxima (Fig. 2)

ICX® Technology

Innovative compounding and extrusion technology

$$\text{Customer value (CV)} = \frac{\text{Quality (Q)} \cdot \text{Flexibility (F)}}{\text{Price (P)} \cdot \text{Time (T)}} \hat{=} \text{Investments}$$

Disclaimer: All specifications and information given in this brochure are based on our current knowledge and experience. A legally binding promise of certain characteristics or suitability for a concrete individual case cannot be derived from this information. The information supplied here is not intended to release processors and users from the responsibility of carrying out their own tests and inspections in each concrete individual case. AKRO®, AKROMID®, AKROLEN®, AKROLOY®, AKROTEK® and ICX® are registered trademarks of the Feddersen Group.

We will be pleased to meet you!

AKRO-PLASTIC GmbH

Member of the Feddersen Group

Industriegebiet Brohltal Ost

Im Stiefelfeld 1

56651 Niederzissen

Germany

Phone: +49(0)2636-9742-0

Fax: +49(0)2636-9742-31

info@akro-plastic.com

www.akro-plastic.com

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the latest version
of our brochure:



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