

AKROMID® S – The Engineering Biopolymer



BIO-FED 

BIO-FED
Branch of AKRO-PLASTIC GmbH

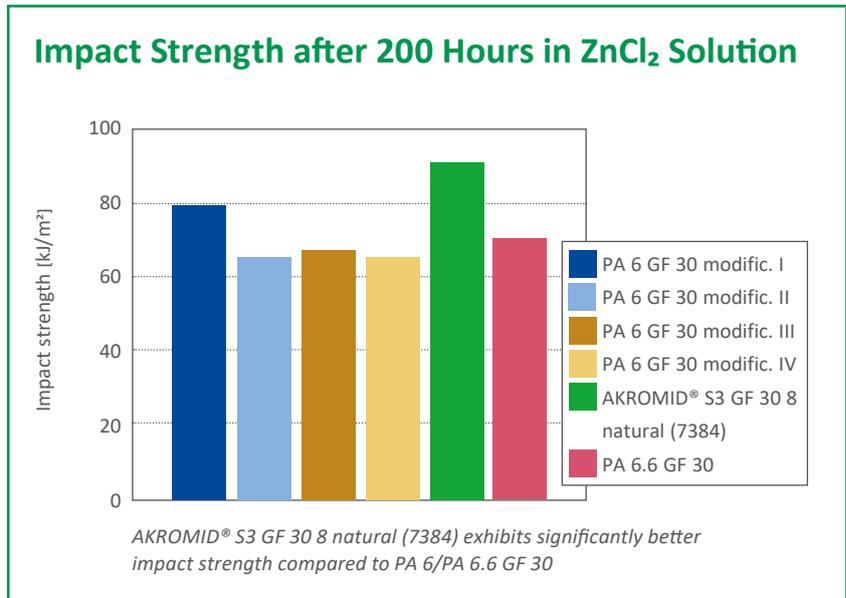
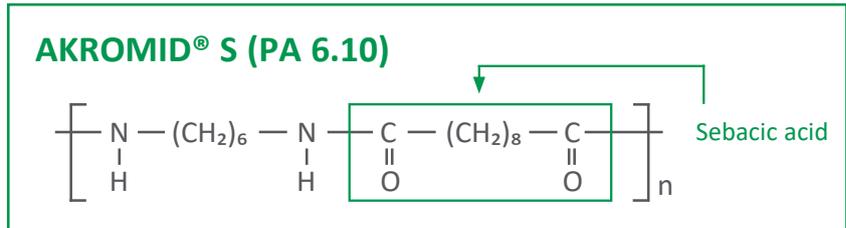
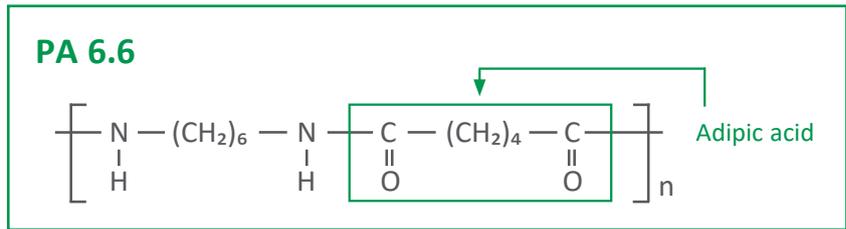
Product Characterisation

Although sebacic acid-based polyamides were developed and commercialised as early as the 1950s, they remained niche products on the market, since it was large-scale industrial production of standards that was promoted. In recent years, however, the plastics processing industry has seen a steadily growing interest in materials based on renewable resources. As part of its commitment to meeting these requirements, BIO-FED focuses on the development, compounding and marketing of bio-based and/or biodegradable plastics, initiating a renaissance of this material.

A characteristic property of AKROMID® S (PA 6.10) is that it has a renewable-resource content of up to 60 % and therefore fulfils the current definition of a bioplastic¹. The plant-based raw material used is sebacic acid, synthesised from castor oil which is obtained from the seeds of *Ricinus communis*, the castor oil plant.

From a technical standpoint, AKROMID® S closes the gap between PA 6/PA 6.6 and PA 12. It is characterised by significantly lower moisture absorption compared to PA 6 and PA 6.6. At 23 °C and 50 % relative humidity, typical values for these product types are 3 % and 2.8 %, respectively. With a value of approximately 1.4 %, PA 6.10 absorbs just half as much moisture and can therefore be used as an engineering material in applications requiring a high dimensional consistency. Moreover, it exhibits excellent cold impact resistance. Other outstanding characteristics include very good chemical resistance due to the structure of the polymer and high hydrolysis resistance, although it can be processed like all common polyamides.

The materials from the PA 6.10 product family are further characterised by exceptional dimensional



stability, good surface quality, good abrasion resistance and wear behaviour, and an improved carbon footprint. This is due to the fact that the plant-based raw materials have already removed CO₂ from the environment during their growth phase.

The product portfolio currently includes the following variants:

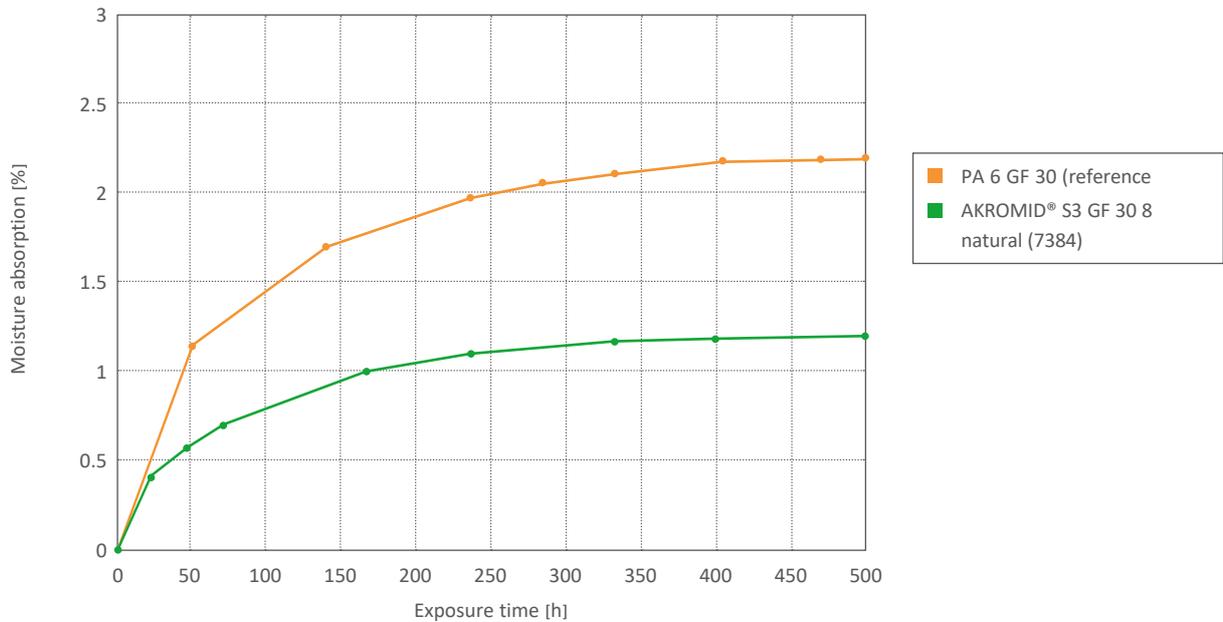
- AKROMID® S3 8 natural (4881) non-reinforced
- AKROMID® S3 GF 30 8 natural (7384) with 30 % glass fibre content

These two variants are approved for direct food contact.

¹ = definition of Bioplastics according to Prof. Dr. Ing. H.-J. Endres, FH Hannover

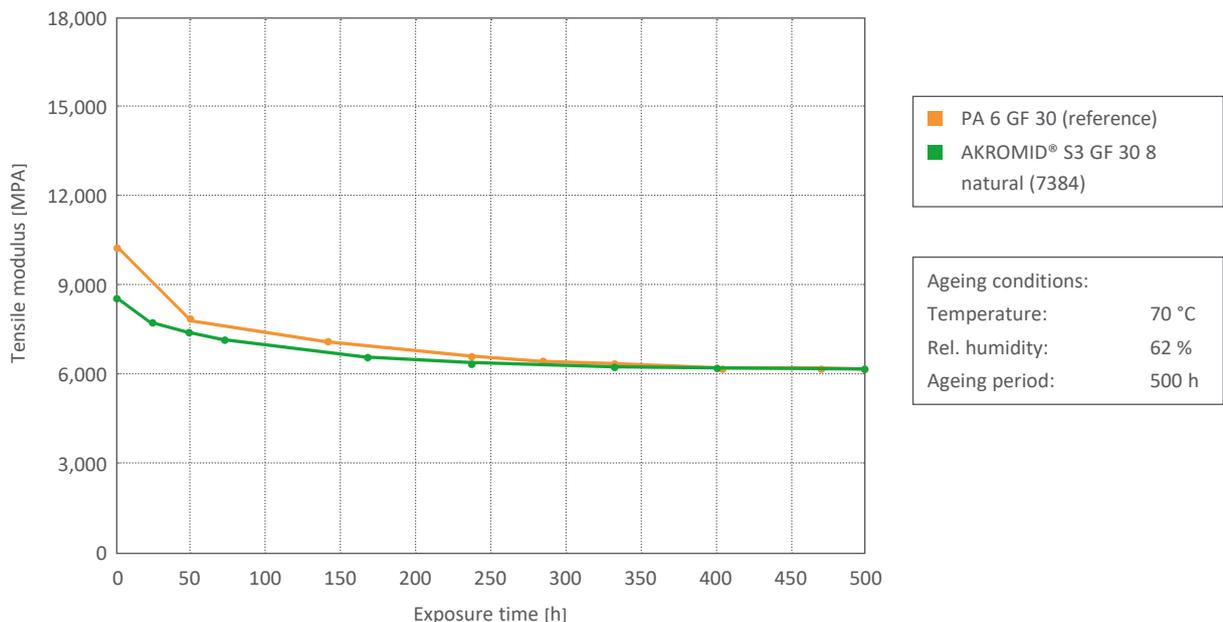
A comparison of technical properties shows the outstanding differences between AKROMID® S3 GF 30 8 natural (7384) and comparable a PA 6 compound:

Moisture Absorption vs. Exposure Time – 500 h at 70 °C and 62 % Rel. Humidity



AKROMID® S3 GF 30 8 natural (7384) absorbs approx. 50 % less moisture than a PA 6 GF 30

Tensile Modulus as a Function of Exposure Time



Ageing conditions:
 Temperature: 70 °C
 Rel. humidity: 62 %
 Ageing period: 500 h

Following moisture absorption, tensile modulus in AKROMID® S3 GF 30 8 natural (7384) decreases significantly less than in PA 6 GF 30

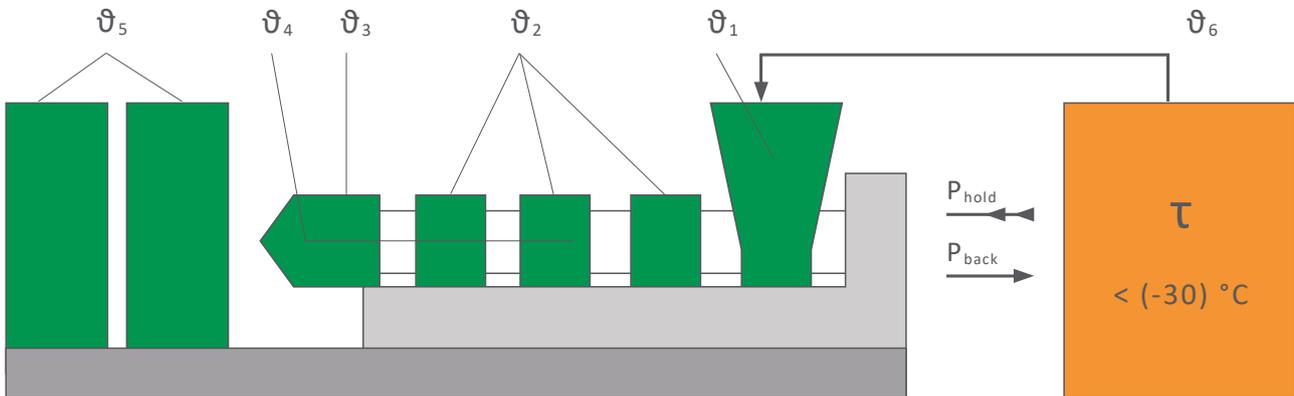


Processing Recommendations

AKROMID® S can be processed on commercially available injection moulding machines with standard

screws according to the recommendations of the machine manufacturer. Please refer to the table below

for our recommended machine, mould and dryer settings (see diagram):



AKROMID® S		
Flange	ϑ_5	60–80 °C
Sector 1 – sector 4	ϑ_2	230–290 °C
Nozzle	ϑ_3	230–300 °C
Melt temperature	ϑ_4	250–290 °C
Mould temperature	ϑ_5	40–100 °C
Drying	ϑ_6	80 °C, up to 4 h
Holding pressure, spec.	P_{hold}	300–800 bar
Back pressure, spec.	P_{back}	50–150 bar

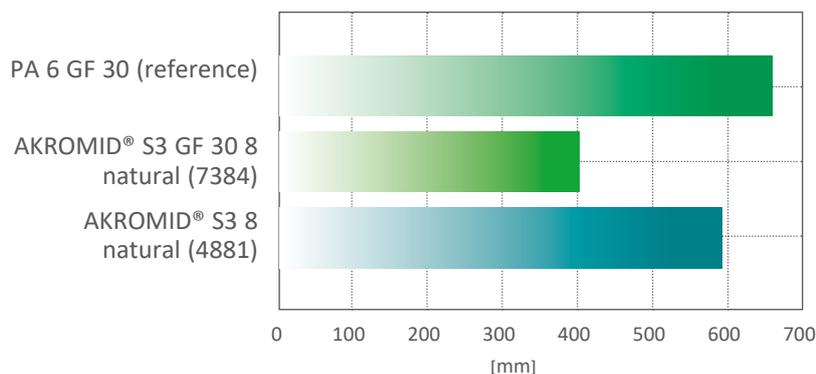
The specified values are for reference values. For increasing filling contents the higher values should be used.

For drying, we recommend using only dry air or a vacuum dryer. Processing moisture levels between 0.02 and 0.1 % are recommended.

The drying time of freshly-opened bags is up to 4 h. It is recommended to use opened bags completely.

Material processed from silo or boxes requires a minimum drying time of 4 h.

Flow Length



Melt temperature: 270 °C
 Mould temperature: 80 °C
 Injection pressure: 750 bar
 Cross section: 7*3.5 [mm²]
 Moisture content: 0.06 – 0.07 %

Disclaimer: The information contained herein is 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. BIO-FED® and AKROMID® are registered brands of AKRO-PLASTIC GmbH.



Applications

Based on the technical properties shown for the AKROMID® S series, the following applications are possible:

Machine Construction and Tool-building

- Plugs
- Housings
- Functional parts
- Etc.

Food Industry

- Packaging
- Crates
- Containers for liquid
- Etc.

Sports and Leisure

- Gardening tools
- Bicycle accessories
- Etc.

AKROMID® S is a bioplastic that meets today's standard definition. Like certain materials used in the packaging industry, however, the material is not biodegradable.

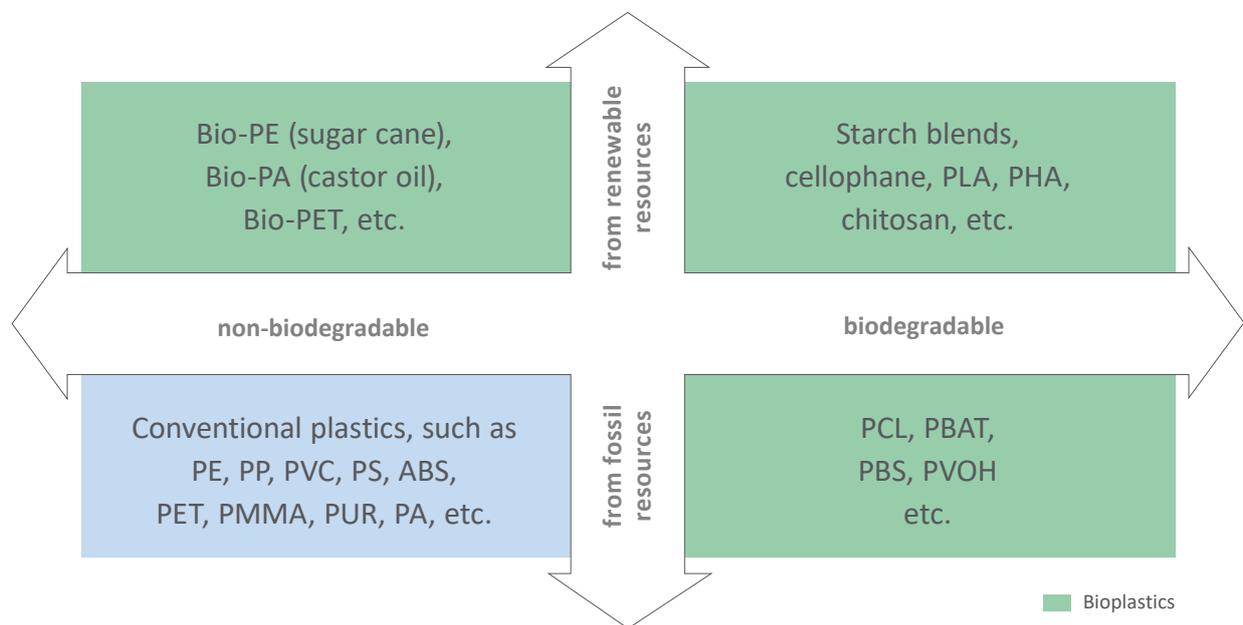
What distinguishes AKROMID® S is its reduced carbon footprint: the use of harmful CO₂ per tonne of polyamide produced from renewable resources is significantly lower compared to one tonne produced from fossil-based resources, without affecting the product's performance characteristics.

Definition

Bioplastics are materials which are biodegradable and/or produced based on renewable resources (biobased). These materials have properties similar to those of conventional plastics and can be warehoused in a comparable manner. They can be processed on standard plastics machines.



Bioplastics Coordinate System



We Will Be Pleased to Meet You!

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Here you can find
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