

MOCOM

Altech® PARA

Polyarylamides with very high stiffness
and attractive surface quality

With Altech® PARA, MOCOM offers a new high-performance compound based on polyarylamide for the highest technical requirements. With Altech® PARA, the Hamburg-based compounding specialist is expanding its portfolio by introducing a material that combines very high stiffness, high surface quality, and strong dimensional and temperature stability for particularly challenging applications.

The strong property profile of the Altech® Polyarylamide (PARA) series from MOCOM makes the products interesting for applications in which polyamides usually reach their limits. High surface quality at high filling levels, significantly reduced moisture absorption and thus higher dimensional stability, as well as lower thermal expansion are just some of the direct advantages of PARA compared to a classic polyamide 6 or polyamide 6.6.

MOCOM aimed to develop a polyarylamide with a glass fiber content of 50% in order to be able to serve applications with high mechanical loads. This adds another high-performance product to the Altech® portfolio.

Exceptional mechanical performance

PARA with 50% glass fiber filling unfolds an exceptional mechanical performance that clearly stands out from classic polyamides. The aromatic structure of the polyarylamide ensures very high stiffness and strength, which is further enhanced by the high glass fibre content. This results in components that can withstand even heavy loads and reliably retain their shape. Particularly noteworthy is the high dimensional stability: While conventional polyamides can noticeably lose dimensional accuracy due to water absorption and temperature changes, PARA remains almost unchanged even in the conditioned state.

Feature	Altech® PARA GF50	PA66 GF50	PA66+6IX GF50	Competition PARA GF50
Density (ISO 1183)	1.64 g/cm³	1.56 g/cm³	1.58 g/cm³	1.64 g/cm³
E-Modulus dry/conditioned (ISO 527)	18300 / 18300 MPa	15230 / 10270 MPa	17000 / 13700 MPa	18600 / 17500 MPa
Tensile strength dry/conditioned (ISO 527)	258 / 239 MPa	204 / 140 MPa	245 / 185 MPa	268 / 243 MPa
Elongation at break dry/conditioned (ISO 527)	2,1 / 2 %	3 / 4,9 %	2,5 / 3,3 %	2,2 / 2,3 %
Charpy Impact Resistance dry/conditioned (ISO 179/1eU)	65 / 54 kJ/m²	80 / 85 kJ/m²	95 / 93 kJ/m²	78 / 61 kJ/m²
Charpy Notched Impact Strength dry/conditioned (ISO 179/1eA)	9 / 9 kJ/m²	12 / 18 kJ/m²	15 / 17 kJ/m²	10 / 10 kJ/m²
HDT A (1,8 MPa) (ISO 75-1/-2)	228 °C	260 °C	247 °C	230 °C

Advantages of Altech® PARA compared to conventional polyamides at a glance:

- Higher stiffness and strength due to aromatic structure and a glass fiber content of 50%
- Very low water absorption and better dimensional accuracy
- High dimensional stability even under changing environmental conditions
- Excellent surface quality and sprayability

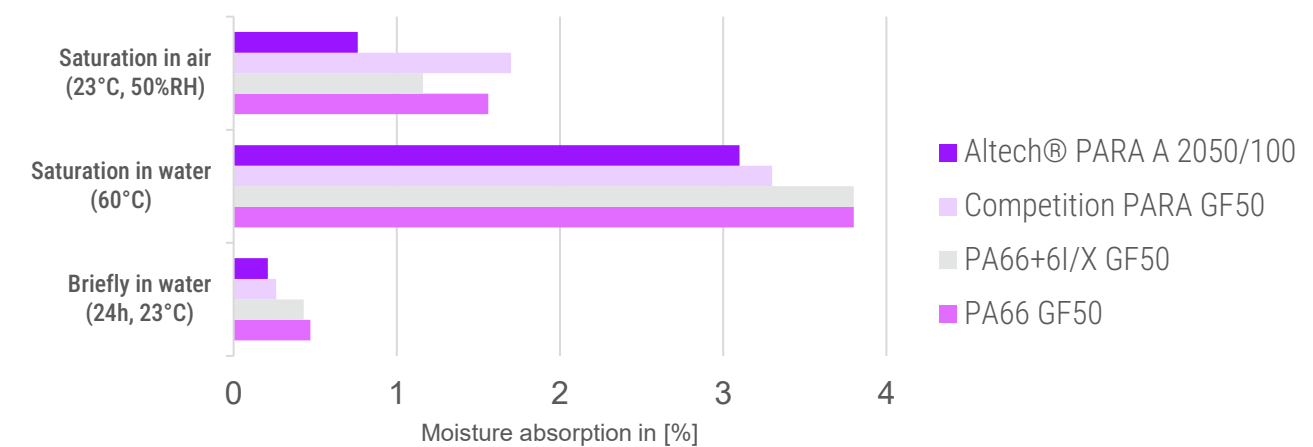
With Altech® PARA, MOCOM offers its customers the opportunity to push the boundaries of classic polyamides and use polyarylamide compounds for high-precision, resilient and durable applications, ranging from automotvie and electrical components to highly stressed mechanical parts and precision components in medical technology.

Low water absorption

A particularly noteworthy advantage of PARA is its extremely low water absorption, which clearly distinguishes it from classic polyamides. While polyamide 6 or polyamide 6.6 are comparatively hygroscopic due to their aliphatic structure and thus absorb moisture from the environment, PARA remains largely resistant to water absorption due to its aromatic molecular structure. This property has a direct effect on dimensional accuracy and mechanical stability: components made of PARA reliably maintain their dimensions even under changing climatic conditions and show hardly any swelling or shrinkage.

In practice, this means that PARA retains its high stiffness and strength even in humid environments or in direct contact with water. Classical polyamides often lose a significant part of their mechanical performance under such conditions, as the embedded water molecules make the polymer chains more mobile and thus reduce stiffness. PARA, on the other hand, remains almost unchanged even in the conditioned state, making it an ideal material for precision components that require permanently exact dimensions and constant mechanical properties.

Water absorption according to DIN EN ISO 62



Dimensional stability

PARA offers exceptionally high dimensional stability, which makes it particularly attractive for precise engineering components. Due to its aromatic polymer structure, PARA has very low shrinkage during injection molding, which enables tight tolerances and reproducible component geometries. At the same time, the material has a low coefficient of thermal expansion, so that the dimensions hardly

change even with temperature fluctuations. Combined with minimal water absorption, PARA remains dimensionally even under thermal and climatic stress – ideal for applications where long-term precision is critical.

Feature	Altech® PARA GF50	PA66 GF50	PA66+6IX GF50	Competition PARA GF50
Shrinkage longitudinal/transverse	0,1 / 0,3	0,3 / 0,8	0,3 / 0,6	0,2 / 0,3
Coefficient of Thermal Expansion longitudinal/transverse (20°C to 80°C)	1,3 / 4,2	1,4 / 11,3	4,3 / 8,5	0,4 / 5,6

Surface (gloss)

Another outstanding advantage of PARA is its particularly high surface quality, which clearly distinguishes it from classic polyamides. The aromatic structure and the very fine glass fiber distribution result in components with an exceptionally smooth and homogeneous surface. Even with high glass fiber content of 50%, the surface remains free of typical roughness or visible fiber structures, which often occur with conventional polyamides.

This property is not only an aesthetic advantage, but also has functional significance. A high-quality surface facilitates further processing, for example during painting, printing or coating, as no additional pre-treatments are required. In addition, the smooth surface improves the feel and makes PARA components suitable for applications where optical and tactile quality is crucial – for example, in visible parts in automotive engineering, electrical engineering or medical technology.



Target applications

PARA with a high glass fiber content opens up a wide range of applications that go far beyond the classic fields of application of polyamides. Its combination of high stiffness, low water absorption, excellent surface quality and thermal stability makes it a preferred material for demanding technical components.

In automotive engineering, for example, PARA is used for structural and housing parts that have to withstand permanently high mechanical loads and changing environmental conditions. These include, for example, components in the engine compartment that require both temperature resistance and dimensional accuracy, or components in the area of cooling water systems, where low water absorption is decisive.

In electrical engineering and electronics, PARA is ideally suited for housings, connectors and precise components that require high

dimensional accuracy and a smooth surface. The low moisture absorption ensures that electrical properties remain stable and prevents deformations that could impair function.

PARA is also used in mechanical engineering, especially for highly stressed structural parts that can replace metal. The high stiffness and strength of PARA GF50 make it possible to produce lightweight but extremely resilient components that combine the advantages of plastic injection molding with the performance of metallic materials.

In addition, due to its surface quality and dimensional accuracy, PARA is also interesting in medical technology, where precise and optically high-quality components are required. Thin-walled, complex geometries can be reliably realized with PARA without compromising mechanical stability.

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