



# Technical ceramics

→ since 1865

## Our company

Established in 1865, Haldenwanger – Morgan Advanced Materials – has since developed into a leading global producer of high-tech ceramics. We offer you a comprehensive product range of oxide and non-oxide materials, primarily for use in demanding thermal, chemical and mechanical applications. By virtue of our extensive ceramic expertise, we are able to act not only as your supplier but also as a reliable partner in finding solutions to any technical challenges you may face.

The Haldenwanger Group employs more than 400 people at three locations:

- Germany
- USA
- China

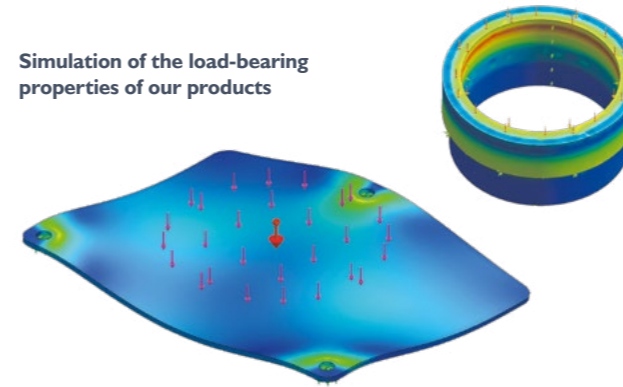


The British parent company Morgan Advanced Materials employs approx. 7,400 people at over 75 locations worldwide.

## Our motto: “Beat the Heat!”

We are your specialist for technical ceramics – especially for use at high temperatures. Our in-house material and process development enables constant and independent improvements. At our ceramic pilot plant, we test new materials and technologies and carry out series qualification before the actual start of production. In our testing and development laboratory, we examine material structures, evaluate specific application situations and conduct strength calculations.

Simulation of the load-bearing properties of our products



Our competencies cover the entire ceramic process chain. We embrace lean management and work successfully with management systems such as Six Sigma and Design for Six Sigma.

## Our network

Our research and development work is closely networked with colleagues at Morgan Advanced Materials as well as with external partners, such as testing and research institutes and universities. Our goal is to carry out research and to develop with the aim of finding the best ceramic solutions for our customers!

## Our history

In 1865, Wilhelm Haldenwanger founded a porcelain manufactory in Berlin. In 1910, the production of ceramic tubes began. Haldenwanger grew in the sixties with the boom in the steel industry and a sales office and warehouse were established in Düsseldorf in 1962. Further production sites were added in Waldkraiburg, Bavaria. In 1997, Haldenwanger was acquired by the English group Morgan Crucible Company PLC. Following a restructuring in 2004, the production, development and sales divisions were centralised at the Waldkraiburg site.



### Core competencies of Morgan Advanced Materials:

- Application Engineering
- Materials Science
- Customer Focus



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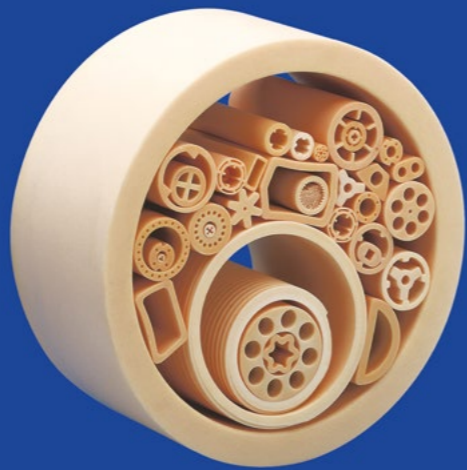


## Our product groups

Modern technologies place huge demands on materials. Technical ceramics come into their own right at the point where other materials have long failed. Through the use of highly purified, synthetic raw materials, technical ceramics have made their mark as a high-strength, high-tech material for extreme applications.

### Our materials

- aluminium oxides
- aluminium silicates
- laboratory porcelain
- zirconium oxides
- silicon carbides
- fused silica
- foamed ceramics
- coatings



#### Diversity – tubes

Stable processes

require customised components. Our comprehensive range of tubes provides optimal solutions for applications up to 2000°C, whether in aggressive media or under high thermal shock. We offer a total of 15 oxide and carbide materials in numerous designs, including Alsint 99.7 (C 799), Pythagoras (C 610) and Sillimantin 60 (C 530), in accordance with DIN EN 60672. Use our wide Haldenwanger range to optimise your processes.

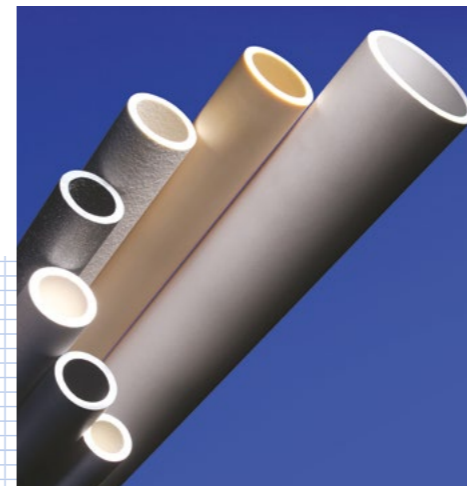
#### High performance – Halsic

The Halsic name stands for exceptional ceramic high-performance materials from the silicon carbide (SiC) group. We supply kiln furniture structures, plates, beams, rollers and special designs with excellent heat transfer values for efficient energy utilisation and an optimal kiln-furniture-to-sintering-material relation.



#### Long service life – rollers

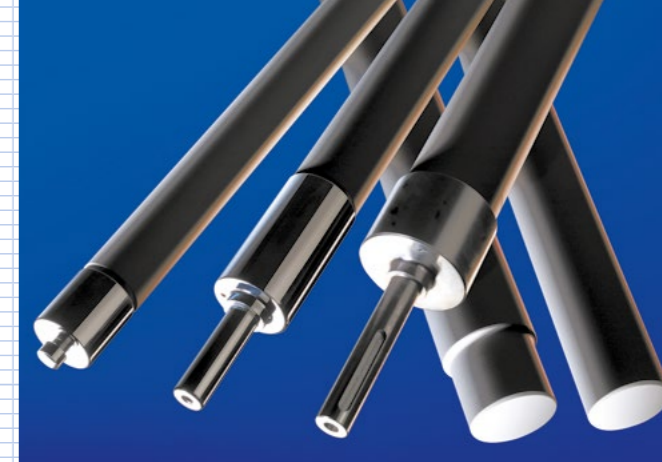
Perfectly adapted materials and dimensions extend the service life of ceramic rollers. A unique range of materials with more than ten oxide and carbide materials for application temperatures of up to max. 2000°C combined with more than 50 years of roller expertise ensure the durability of our rollers. We manufacture standard and high-end qualities for applications such as the firing of wall and floor tiles, roof tiles, tableware porcelain or sanitary ceramics.



#### Tradition – laboratory porcelain



Haldenwanger has been producing and optimising laboratory porcelain for over 150 years. Our quality and our extensive delivery programme have made us known worldwide. The properties of our laboratory porcelain comply with DIN EN 60672-3, type C II0. For higher demands, we also offer laboratory items such as crucibles, plates, boxes and boats made from Alsint 99.7 dense, Alsint porous or zirconium oxide.



#### Excellent surface finish – fused silica rollers

Their outstanding mechanical properties and special surface finish make our fused silica rollers indispensable as transport rollers in all kinds of glass tempering furnaces. These furnaces are used to finish safety glass for use in architecture and the automotive industry. Among other things, we also offer fused silica rollers with integrated metal end caps in many designs. Customised shapes and HalCoat Si<sub>3</sub>N<sub>4</sub> coatings are also available.

#### Flexibility – specialities

At Morgan Advanced Materials Haldenwanger, we can manufacture customised dimensions with our diverse production technologies, such as extrusion, casting, isostatic pressing and dry pressing. Furthermore, our extensive materials portfolio includes special materials for special applications such as zirconium oxides (MgO-PSZ, CaO-FSZ), MgO-Spinel and ceramic foams (HalFoam Alumina, HalFoam Fused Silica).

