

Application Fields for Ceramic Materials

# Chemical Engineering, Environmental Engineering, Biotechnology, Medical Engineering



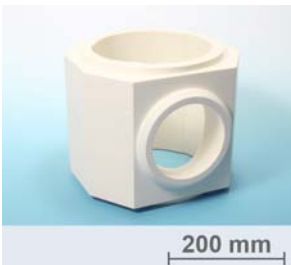
Chemically inert ceramic materials are a prerequisite for long lasting components in chemical processing, many environmental engineering applications and biotechnology. Superior bio-inertness and biocompatibility predestine certain oxide ceramics as best suitable materials for implantable medical devices.

## Chemical Engineering

For decades corrosion and wear resistance of ceramic materials is effectively used in chemical processing to ensure economic production. Wherever aggressive media are conveyed, stirred or metered advanced ceramics components are indispensable. Pharmaceutical or cosmetics filling processes without contamination are often based on ceramic materials in media contacted areas of the equipment.

### Examples:

- Actuators and controls for aggressive media
- Components for magnetically coupled pumps
- Slide rings in mechanical seals
- Filling pumps for cosmetics and pharmaceuticals
- Membranes in the electroplating industry

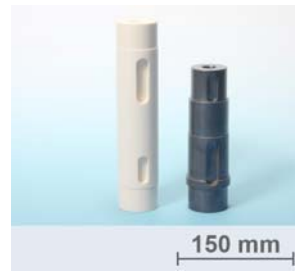


### Contact

Daniel Lorenz  
Sales  
Tel: +49 3304 38399-54  
Fax: +49 3304 38399-90  
E-Mail:  
dlorenz@hiper-ceramics.de

### HiPer Ceramics GmbH

HiPer Ceramics GmbH  
Ziegeleistraße 7  
16727 Oberkrämer  
Tel.: +49 3304 38399-0  
Fax: +49 3304 38399-90  
E-Mail: hiper@hiper-ceramics.de  
Web: www.hiper-ceramics.de

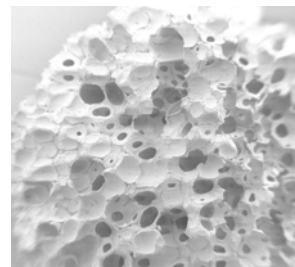


## Environmental Engineering

Environmental applications of ceramic materials are common. Filter elements for sewage treatment plants, tensiometer cells for soil water tension measurements and linings for waste incinerating plants are just a few examples of specifically tailored advanced ceramics products.

### Examples:

- Porous parts for soil investigation
- Filter elements for sewage treatment plants
- Catalyst carriers for detoxification equipment
- Linings for incinerators



## Biotechnology

Only recently advanced ceramics are applied in biotechnological applications. Naturally, bioinertness or biocompatibility are the crucial properties sought for in this type of application.

### Examples:

- Spargers for oxygen supply in fermentation equipment
- Components for gel electrophoresis apparatuses
- Grinding tools for cell disruption

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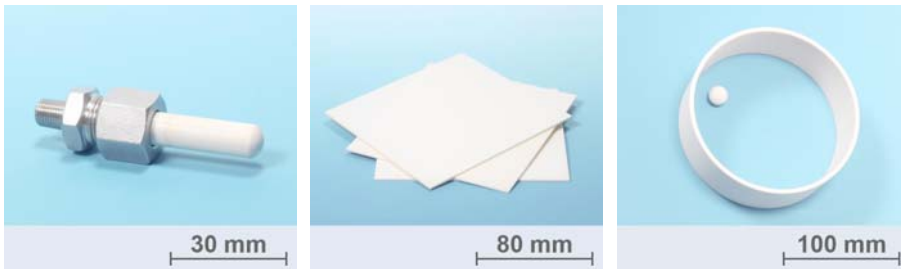
HiPer Ceramics GmbH  
Ziegeleistraße 7  
16727 Oberkrämer  
Tel.: +49 3304 38399-0  
Fax: +49 3304 38399-90  
E-Mail: [hiper@hiper-ceramics.de](mailto:hiper@hiper-ceramics.de)  
Web: [www.hiper-ceramics.de](http://www.hiper-ceramics.de)





# HiPER

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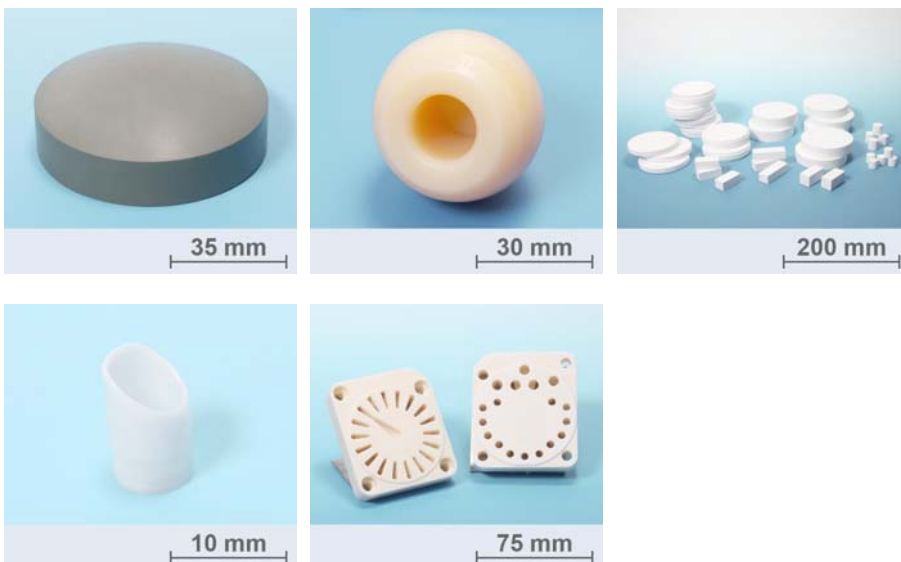


## Medical Engineering

Various medical devices profit substantially from advanced ceramics regarding longevity and patient compatibility. Aesthetic dental restorations, extremely durable implants and bioinert components for active medical devices would not perform as well as they do without appropriate advanced ceramic materials.

### Examples:

- Cutting tools for tissue sections
- Casting moulds for ophthalmic lenses
- Hip implants
- Dental crowns and abutments
- Components for minimally invasive instruments



HiPer Ceramics GmbH

HiPer Ceramics GmbH  
Ziegeleistraße 7  
16727 Oberkrämer  
Tel.: +49 3304 38399-0  
Fax: +49 3304 38399-90  
E-Mail: [hiper@hiper-ceramics.de](mailto:hiper@hiper-ceramics.de)  
Web: [www.hiper-ceramics.de](http://www.hiper-ceramics.de)

