

# OXIDKERAMIK J. Cardenas GmbH: High-Performance Ceramic Materials from Germany

Extremely hard, superbly corrosion resistant, exceedingly wear and temperature resistant – these are just some of the properties of technical ceramic materials. OXIDKERAMIK J. Cardenas GmbH manufactures different ceramic materials, ultra-pure aluminium oxide ceramics, direct sintered silicon carbide and two different zircon oxide ceramics.



Fig. 1  
Ceramic components made of OK 997,  
CR 105, CR 101 and CARSIC 310

The family-run company OXIDKERAMIK J. Cardenas GmbH based in Albershausen in Baden-Württemberg/DE, has devoted itself to the fascinating world of ceramics for almost half a century. The

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highest level of precision has always been a guarantee of the high quality of the company's technical ceramic products.

The company aims to implement every customer requirement in a tailor-made solution. Depending on the technical demands, the customer receives a ceramic component to meet his individual needs. Highly precise constructions and tolerances with superb surface quality guarantee the high performance of the components. The ceramic components manufactured by OXIDKERAMIK J. Cardenas GmbH are characterised by their high wear resistance, extreme hardness and compressive strength, which is achieved by the special materials the company employs. These comprise the ultra-pure aluminium oxide ceramic OK 997, the direct sintered silicon carbide CARSIC 310 and the two zircon oxides CR 101 and CR 105.

Each of these special ceramic materials boasts specific properties that make them indispensable materials for technically demanding areas of use. The ultra-pure aluminium oxide ceramic OK 997 containing 99,7 %  $Al_2O_3$  is also ideal as an electrical insulating material. It is very wear resistant and displays a very high dielectric strength. OK 997 is suitable for use in an ultrahigh vacuum environment and resists temperatures up to 1500 °C. OXIDKERAMIK J. Cardenas GmbH employs this material to manufacture such products as highly accurate sealing elements, plain bearings, pistons and cylinders. The products also

have a superb surface quality and smoothness.

Zircon oxide CR 105 can also be employed in this area. At OXIDKERAMIK J. Cardenas GmbH it is partially stabilised by yttrium oxide. The material is characterised by its very good bending strength and fracture toughness. To meet special requirements the company's ceramic components can also be manufactured with very stable corners and cutting edges. CR 105 also has a relatively low heat conductance.

Because of their specific properties the materials OK 997 and CR 105 are well suited for the manufacture of highly precise and complex precision components used in the food industry and for medical instruments. CR 101 is the second material in the area of zircon oxide ceramics that the company manufactures. It is stabilised by means of magnesium oxide and is extremely wear resistant with high compressive strength. CR 101 displays a low welding tendency with metal and enables – as with CR 105 – good thermal insulation. Both zircon oxide materials offer a very high corrosion resistance. CR 101 is predominantly used by OXIDKERAMIK J. Cardenas GmbH to manufacture components for the electrical

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*Fig. 2  
Ceramic components with individual design for mechanical engineering*

industry such as, for example, insulators or components for wear resistance in machine and plant construction.

The material CARSIC 310 possesses a very high corrosion and wear resistance. The components that the company manufactures from it are used in pump construction, chemical plant construction and the food sector. Even at high temperatures and in aggressive media CARSIC 310 displays excellent tribological properties. Because OXIDKERAMIK J. Cardenas GmbH take great



*Fig. 3  
High precision pump components made of OK 997*

care in producing the required plain and sealing surfaces with high precision, the products manufactured from CARSIC 310 can be found in high pressure pumps or in especially heavy duty sealing elements. The company employs CARSIC 310 in metal composite solutions, too. This combines the advantages of the excellent material properties of silicon carbide CARSIC 310 with those of assembly-friendly metal. The long-service life and operational safety that result ensure that any solution is a highly



*Fig. 4  
Silicon carbide joined with stainless steel*

efficient one. A metal composite makes a low-gap and hygienic design possible that is easy to clean and sterilise.

The products produced by OXIDKERAMIK J. Cardenas GmbH (Fig. 1–4) enable the customer to constantly adapt to the ever increasing demands of top technologies. The company's employees are experts in the use of technical ceramics in all areas of application. They work with the customer to continually devise new ways to incorporate ceramic components in new fields and combinations. Its broad material know-how and comprehensive manufacturing experience make OXIDKERAMIK J. Cardenas GmbH a strong partner at its customers' side. This is why, in the field of technical ceramics, the company is always the first choice.