

# FCT Ingenieurkeramik: Strengthened by Merge with FCT Hartbearbeitung

The FCT Group/DE was formed from KCE Sondermaschinen GmbH/DE, the company founded by Heinz Kessel in 1982. This was transformed into FCT (Fine Ceramics Technologies) in 1992. Over the last few years, the FCT Group has operated in the following three business segments: FCT Systeme GmbH (founded in 1996): System consulting, development and engineering of high-temperature sintering equipment for high-performance ceramics, powder metallurgy and photovoltaics; FCT Hartbearbeitungs GmbH (founded in 1994): Precision grinding (hard machining) and production of ceramics and hard materials. FCT Ingenieurkeramik GmbH (founded in 1996): Development and production of components made of high-performance ceramics and services (sintering, hot pressing, hot and cold isostatic pressing). With effect from 01.09.2015, FCT Hartbearbeitungs GmbH was merged with FCT Ingenieurkeramik GmbH (Fig. 1). The former affiliated companies are now operated as one company under the name of the existing FCT Ingenieurkeramik GmbH and are now active on the market under one umbrella brand. The Managing Partner, Dr Karl Berroth (KB), updated us on the new situation (Fig. 2).



Fig. 1  
FCT Ingenieurkeramik GmbH plant and  
headquarter in Frankenblick/DE

**CA:** The focus of FCT Hartbearbeitungs GmbH was initially precision machining of components made of ceramic and hard materials. In the merged company today, how high is the percentage of your hard-machining service or services in general?

**KB:** Originally, this service made up at least 80 % if you look at the early years of the two companies. Today, it still makes up 20 % at most. We also offer services in shaping or sintering. Especially, our equipment for large-size parts is in demand (cold isostatic press or gas pressure sintering equipment with 900 and 800 mm useful diameter respectively). The core expertise of FCT Ingenieurkeramik is, however, the production of complex, especially large-size components made of high-performance ceramics such as silicon nitride, silicon carbide, and zirconia as well as tailored composite and special materials.

**CA:** What are the most important user markets for these ceramic components?

**KB:** We are in competition with other materials – ceramic is often the most expensive solution, but also the most efficient in applications with high technical requirements. To this end, we find more and more interesting challenges, but, for a range of different reasons, we often lose follow-on orders. We had, for example, undertaken special developments for a German manufacturer of photovoltaic panels. This market has, however, very quickly drifted off to China.

Ongoing development work is therefore essential to come up with innovations and new applications on the market.

In the scope of the German SME summit in Essen in June 2015, we were honoured to be named one of the TOP100 most innovative companies in Germany. Then in Thuringia in autumn followed the “Advancement through Innovation” award from the Chamber of Industry and Commerce (Fig. 2). Arguments in our favour were our wide flexibility and offering of innovative, customer-oriented solutions. This indicates that we are willing to respond to very specific requests.

We have worked hard to achieve this position in different fields. Aerospace and machine engineering make up in the region of 15–20 % sales. In addition, in aluminium foundry technology, with around 10 % sales, we have another solid mainstay, which we are able to expand, although here with strong competition from the Far East. Applications in analysis systems are on the same scale. In addition, in certain segments, we are single-source suppliers for speciality products, e.g. friction linings made of C/CSiC for emergency brakes for elevators in high-rise buildings. I already mentioned the around 20 % services in the introduction.

We are also involved in making sputter targets for thin-film technology, e.g. transparent films made of zinc oxide as low-cost variant of ITO films for display technology and thin-film photovoltaics. Overall, we are specialists when it comes to material optimization in respect of fracture toughness, strength, electrical conductivity and corrosion resistance even at high temperatures. Our focuses include complex and high-precision large-sized components as well as high-stiffness, reliable, wear- and corrosion-resistant lightweight components made of  $\text{Si}_3\text{N}_4$ , SiC and  $\text{ZrO}_2$  ceramics. For this purpose, we fabricate prototypes and small to medium product series.

**CA:** In addition to the production processes installed for many years, are you engaged in new manufacturing processes?

**KB:** A new activity is CIM technology, in addition we are also starting with development work in additive manufacturing.

**CA:** How do you manage as an SME to maintain the dynamics in the development work?

**KB:** These R&D projects are supported to a major extent by regional, national and international, publicly funded cooperative projects. In addition come development partnerships with potential users of new components, especially when it is a matter of replacing materials already in use, so as to considerably enhance lifetime and reliability. In demanding, automated processes, companies can less and less afford downtime in short time intervals for necessary service work.

**CA:** Thank you for talking to us.

KS



**Fig. 2**  
Dr Karl Berroth receiving the award “Advancement through Innovation” from the Chamber of Industry and Commerce



**Fig. 3**  
Lightweight silicon nitride instrument platform (GPSN)



**Fig. 4**  
SSiC acid concentrator for chemical engineering