

EXPERTISE IN HIGH-PERFORMANCE MATERIALS

The core competence of FCT Hartbearbeitungs GmbH, a member of the FCT Group, is the precision machining of hard and ultrahard materials, a service which the company offers to external customers.

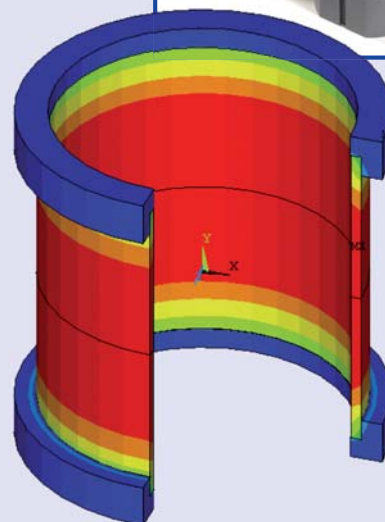
FCT Hartbearbeitungs GmbH also produces a wide range of small to large-sized high-precision ceramic components of complex shapes, made of silicon carbide and zirconium oxide. This wide range of different products is made possible by the almost unique technological facilities available within our group of companies.

FCT Hartbearbeitungs GmbH produces two grades of dense, sintered silicon carbide: the standard S-SiC grade and the high-strength HS-SiC grade. Si-infiltrated (SiSiC) material, liquid-phase sintered (LPS) SiC, and hot-pressed SiC can be produced on request.

SiC components are fabricated in diameter up to Ø600 and in length up to 1.250 mm.

In addition, FCT Hartbearbeitungs GmbH produces two dense, partially stabilized zirconium oxide qualities: Y-PSZ and ATZ. Both qualities contain Al_2O_3 according to the state of the art to improve the hydrothermal resistance (Y-PSZ < 0,5 %, ATZ > 10 %); additional compositions are available on request.

ZrO₂ components are produced in diameter up to Ø400 and in length up to 500 mm.




Properties of the materials produced by FCT Hartbearbeitungs GmbH:

Materials:	Silicon Carbide (Sintered)		Zirconia (Part. Stabilized:Y)	Zirconia (Reinforced: Al ₂ O ₃)
	S-SiC	HS-SiC	Y-TZP	Y- Z20A (ATZ)
Denomination / Grade:				
Density [g/cm ³]	> 3,10		6,05	5,5
Flexural Strength, RT [MPa] ¹	450	550	1000	1200
1000°C	450	550	300	400
1350°C	400	450	-	-
Weibull-Modulus, RT	≥12	≥14	≥12	≥10
Youngs Modulus, RT [GPa]	400		200	240
Fracture Toughness, [MPa*m ^{1/2}]	3 ^{*(2)}		10 ^{*(4)}	8 ^{*(4)}
Hardness, HV/HK, [GPa]	22 ^{*(3)}		12 ^{*(5)}	15 ^{*(5)}
Thermal Expansion, RT-1000°C, [K ⁻¹]	4,5 * 10 ⁻⁶		11 * 10 ⁻⁶	9 * 10 ⁻⁶
Thermal Conductivity, RT [W/m*K]	125		2	5

¹: 4-Pt, 40/20 mm

²: SEVNB

³: HK5

⁴: VHI-ICL

⁵: HV10

FCT Hartbearbeitungs GmbH produces prototypes, special parts, and small to medium-sized production series made to customer specifications. We provide our customers competent advice, supported by computer-based analyses like FEM, in connection with the selection of the best suited material and component design to meet ceramic purposes and the most efficient way of production.

The cooperation with our customers is based on reliability, partnership, and trust. It is our challenge to always find the solution that meets your requirements best and to process your orders in the most economically efficient way.

Certified according to DIN EN ISO 9001:2000

Experience and competence in high-tech ceramics
Challenge us – we find solutions