

# 6C Tools AG

Diamond Tools for the Factory of the Future

*We present*

## TOOLS MADE OF 100% POLYCRYSTALLINE DIAMOND

6C Tools offers a wide range of standardized drilling, milling and threading tools composed of solid polycrystalline diamond (PCD). Additional to the broad selection of standard products, 6C Tools offers tailored PCD and PCBN tools for your application. Together with our experts, we can help you finding ways to optimize your production processes.



### *Applications*

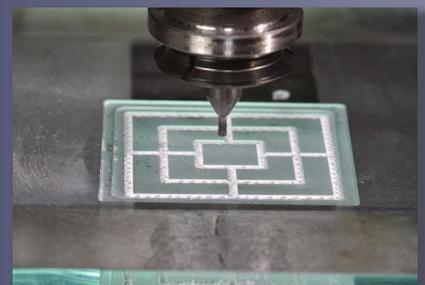
6C Tools products are optimized for the processing of ceramic materials, such as zirconium oxide, aluminum oxide and silicon nitride. Further application areas are the machining of glass and tungsten carbide.



Zirconium oxide

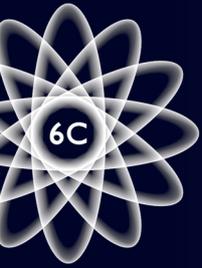


Tungsten carbide



Fused quartz



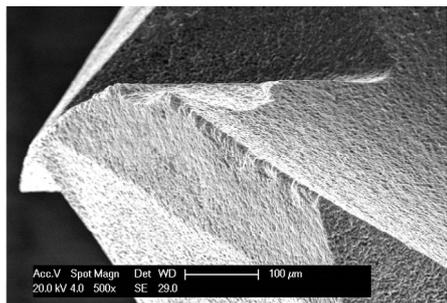


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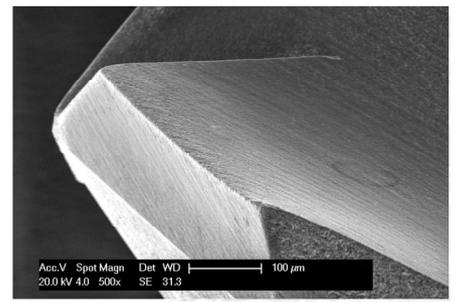
## 100% solid polycrystalline diamond (PCD)

**Conventional:**  
Spark-eroded tool<sup>1</sup>



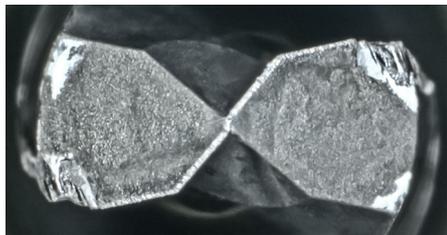
Tool state after 300 bores in CMC (Ceramic Matrix Composite)

**6C Tools:**  
Ultrashort-pulsed laser ablation<sup>1</sup>



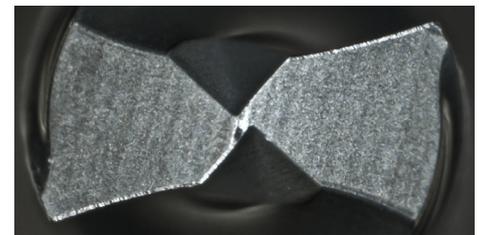
Tool state after 300 bores in CMC (Ceramic Matrix Composite)

**Conventional:**  
Diamond coated tool<sup>2</sup>



- ✘ High wear
- ✘ Low tool-life time

**6C Tools:**  
Solid PKD tool<sup>2</sup>



- ✔ 5 -10x higher tool-life time
- ✔ Precision
- ✔ Process stability



## Advantage

6C Tools PCD and PCBN products are manufactured solely by short- and ultrashort-pulsed laser ablation. Compared to conventional methods - grinding and spark erosion - this technology allows for a particularly gentle material removal. Avoiding damage caused by traditional manufacturing methods significantly increases the wear resistance of 6C Tools products. The force- and wear-free nature of laser processing allows 6C Tools to combine hard tool materials with high precision and good surface quality at a new level of geometric complexity.

<sup>1</sup> Source: P. Butler-Smith et. al., *The influences of pulsed-laser-ablation and electro-discharge-grinding processes on the cutting performances of polycrystalline diamond micro-drills*, CIRP Annals – Manufacturing Technology, Band 2016, Nr. 65, Seiten 105-108

<sup>2</sup> Drilling of ZrO<sub>2</sub>, wearing after 15 bores; n: 3500min; f: 4mm/min; d: 3mm. Source: M. Warhanek et. al., *Comparative analysis of tangentially laser-process-sed fluted polycrystalline diamond drilling tools*, J. of Manufacturing Processes, Band 2016, Nr. 23, Seiten 157-164

