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## **Hot Filament CVD Diamond Coating Technology for Cutting Tool Applications**

Marvin Wegh, Michael Woda, Werner Puetz, Martin Frank, Christoph Schiffers,  
Werner Koelker, Oliver Lemmer, Toni Leyendecker

CemeCon AG, Wuerselen, Germany

marvin.wegh@cemecon.de

In addition to a variety of DLC-based coatings for machining applications and other tribological applications, pure polycrystalline diamond has been established as an excellent coating material in the industrial cutting market for hard to machine materials such as carbon fiber reinforced plastics (CFRP), zirconium oxides, cemented carbide, aluminum silicon alloy and graphite. Modern industrial machining operations often require complex tool geometries that present major challenges for tool coaters. The well-established filament assisted CVD diamond coating technology offers a solution to this challenge while combining complex geometries with extreme mechanical thin film properties. This presentation shall give an insight into the basic principle of Hot Filament CVD diamond deposition for cutting tools on an industrial scale. Furthermore, results of case studies regarding exemplary cutting application on hard to machine materials will be shown. These case studies include applications in CFRP systems for the aerospace industry, zirconium oxide systems for dental applications, direct milling of cemented carbides and milling operations in graphite for the 3C industry (Computer, Communication and consumer electronics).

### **Keywords**

CVD diamond

Hot Filament CVD

Machining

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