VIBRATIONAL SYSTEMS FOR HIGH PERFORMANCE MACHINING

Challenge
Machining of composites, certainly for CFRP, as well as machining of hard materials (break disks made of C/C-SiC) are combined with massive friction and tool wear. These materials can be machined with low productivity or having high costs. Some materials can only be grinded.

Advantages
- Increase of machining quality and reduced tool wear
- up to 40 percent reduced process forces to avoid fiber pull-out and delamination
- increase of tool life of about 50 percent (CFRP)
- reduction of machining time for 50 percent (hard materials)
- avoiding formation of built-up edges and reduction of chip size
- increase of part quality and reduced burr formation

Innovation
High performance machining with vibrational assistance by means of tool excitation with ultrasonic vibration.

Example of use
Longitudinal vibrational system for drilling of CFRP with excitation frequency of 24 kHz and 15 μm amplitude.

Fraunhofer Institute for Machine Tools and Forming Technology IWU
Reichenhainer Strasse 88
09126 Chemnitz, Germany
Department Adaptronics
Nöthnitzer Strasse 44
01187 Dresden, Germany
Dr.-Ing. Thomas Mäder
Phone +49 371 5397-1577
thomas.maeder@iwu.fraunhofer.de

www.iwu.fraunhofer.de