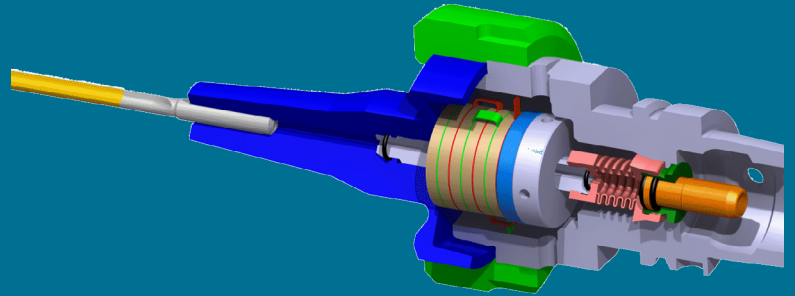




FRAUNHOFER ADAPTRONICS ALLIANCE



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1 Ultrasonic vibrational system with drill, heat-shrink holder and HSK63 fitting

2 CAD sectional view of a vibrational system with piezoelectrical ring actuators

VIBRATIONAL SYSTEMS FOR HIGH PERFORMANCE MACHINING

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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.

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.

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

Our service offer

Development and computation of vibrational systems, experimental characterization, application specific developments for machine integration.

GEFÖRDERT VOM



Bundesministerium für Bildung und Forschung