

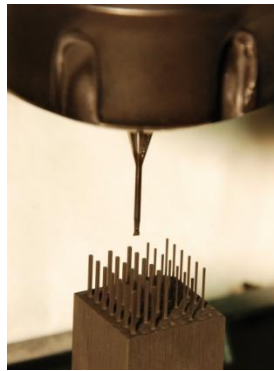
Bachelorarbeit / Masterarbeit

Micro-milling of burr-free electrodes for meso-micro EDM

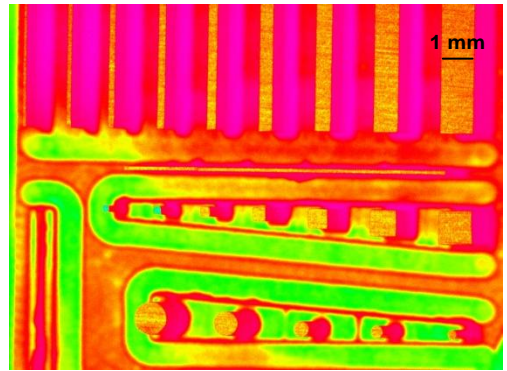
High-Precision milling machine



Micro milling



Microelectrodes from Graphite & Copper



Keywords: Micro – Precision machining, CAM & FEA, Micro-milling, burr-free milling

Motivation

New developments in high speed machining allow machining of extremely fine and precise microstructures with high aspect ratio from fine-grain Graphite enabling to bring EDM in meso-micro scale machining. However, micro-milling of high aspect ratio electrodes require process analysis and modelling for parameter optimisation and ability to machine structures with surface area $< 0.1 \text{ mm}^2$ with aspect ratio $> 10:1$. Such structures are increasingly being used in Electronics, Medicine, Die-Mould and Aerospace industry. This work focuses on machining of high aspect ratio structures from Graphite and Copper while both finding and pushing the limits of micro milling in terms of structure dimension and aspect ratio.

Tasks

- Understanding basics of Micro-milling and Machine: CAD – CAM
- Basic experiments, milling force measurements
- FEA analysis of high aspect ratio structures from Graphite & copper
- Optimisation of the milling process and finding the limits in terms of machined structures dimensions
- Summarise the results and documentation

50% Experimental 30% CAM – FEA 20% Documentation

Required skills

Motivation, interest in precision - micro machining, process modelling & optimisation

We offer

- Work in interdisciplinary team
- Interesting field of Micromachining
- Close contact to the industry

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