TECHNISCHE UNIVERSITÄT DRESDEN

Fakultät Maschinenwesen Institut für Mechatronischen Maschinenbau
Professur für Werkzeugmaschinenentwicklung und adaptive Steuerungen

Aufgabenstellung für Studien- oder Diplomarbeit / SHK-Tätigkeit

Finite element modelling of face milling of NiTi alloy

In order to reduce experimental work, especially for expensive materials and tools, FE simulation can provide insight into machining processes and allow the determination of optimal cutting conditions. The main objective of this study is to simulate the cutting forces, stress fields and temperature fields in the workpiece and tool during face milling of NiTi alloy with different cutting conditions (cutting speed, feed rate, depth of cut, up and down milling). The modeling is carried out in the ANSYS software suite (LSDYNA, ABAQUS or EXPLICIT DYNAMICS).

Experimental setup for face milling of NiTi alloy

Required knowledge and skills of the student:

- Thorough knowledge of metal cutting processes and tools,
- Basic understanding of physical and mechanical properties of metals and alloys,
- Fundamentals of CAE systems,
- Fundamentals of Finite Element (FE) modeling – preferably in ANSYS

Main tasks:

- Development of an FE model for face milling of Nitinol.
- Verification of the developed model with experimental data.
- Numerical study of variable cutting conditions.

Ansprechpartner

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PROFESSUR FÜR WERKZEUGMASCHINENENTWICKLUNG UND ADAPTIVE STEUERUNGEN