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Friedrich-Alexander-Universität
Erlangen-Nürnberg



Seminar über Fragen der Mechanik

zu folgendem Vortrag wird herzlich eingeladen

Dienstag, **03.04.2012, 14:15 Uhr**, Egerlandstr. 5, Raum 0.044

Process Simulation and Two Scale Tool Simulation related to Hybrid Forming

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The focus of this presentation is directed to the numerical simulation of a hybrid forming process for production of a flange shaft with graded material properties. Thereby, the cyclic loaded forming tool is in the main point of interest. An experimental/simulative investigation procedure is introduced for estimation of reference values for the tool lifetime. To this end various aspects of phenomenological process simulation are outlined, e.g. the applied material model for the forming tool, parameter identification, numerical results and experimental validation of the simulation. In a further part this presentation introduces a two scale simulation framework for consideration of multi-layered coated forming tools. To this end the thermo-mechanical boundary value problems on macro and meso scale are outlined and scale transition procedures are addressed for transformation between the two scales. Finally, a numerical example shows failure of the coating system using a damage model on the meso scale and a user-defined element deletion criterion within an explicit solution strategy.

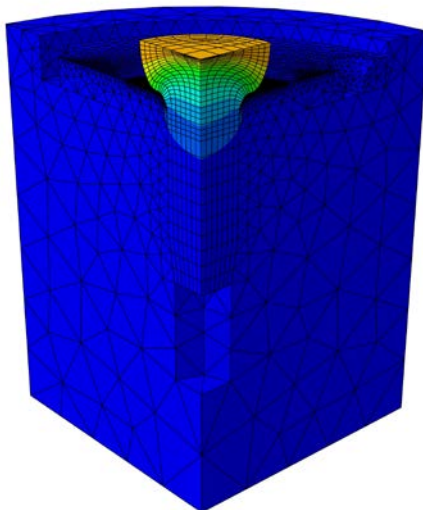


Fig. 1: Deformation and temperature distribution during forming process

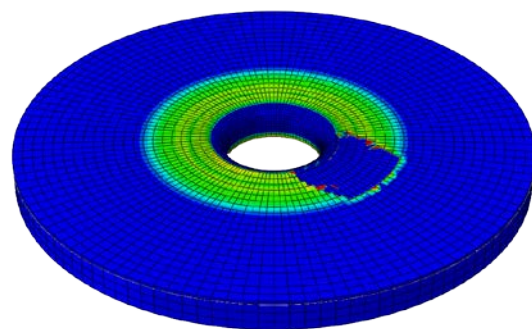


Fig. 2: Modelling of coating failure by damage evolution and element deletion

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