

SA

Theoretical Study

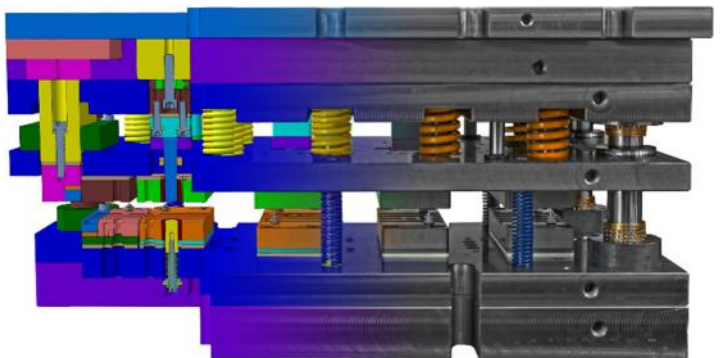
Development of a negative die clearance concept for stress-state variation during shear blanking

Motivation

High-speed shear blanking (HSB) can be used to create cutting surfaces that have exceptional properties in terms of wear, corrosion and fatigue behaviour and can therefore be used directly as functional surfaces.

However, the generation of comparable cutting surface properties is usually associated with high cutting speeds, which require specific machine and tool conditions. For this reason, a negative die clearance concept is to be developed for integration into an existing shear cutting tool in order to alter the stress state at the shear cutting zone and investigate whether this can enable a cutting surface similar to HSB at low cutting speeds.

The concept is to be developed with regard to its integration into the existing tool concept and its applicability to conventional mechanical presses.



Range of tasks

- Research on possible tool-adaptation concepts
- Design of the negative die clearance system
- Design of critical components
- Preparations for tool production (technical drawings, etc.)
- Simulation of shear cutting process with adapted tool concept

It is possible to adapt the focus of the work to individual interests. Research work can be partially conducted remotely.

Prerequisites

- Independent and structured way of working
- Creativity and motivation for learning
- Experience with designing software (SolidWorks, CATIA, etc.)
- Initial experience with tool design and/or construction will be an advantage
- Initial experience with Abaqus CAE software will be an advantage

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Start immediately