

Einfluss von Werkzeugspannmitteln auf die Werkstückqualität bei Stanz- und Tiefziehprozessen

Vibrations and displacements in forming tools and equipment lead to increased wear of the tools and to a reduction in component quality. Previous work has been aimed towards stiffening the equipment and tools and introducing damping systems. However, these solution approaches always mean additional work and expense, with some independent systems having to be integrated into the production line. The object of the present research project was therefore not to consider the tool or the press, but the interface of both systems to each other - the tool clamping situation.

Project Description

The clamping situation has a great influence on the rigidity of the system consisting of die and press. This in turn has an influence on the vibrations of the tool, which can have an effect on wear. In order to reduce the wear as much as possible, the coupling of the tool must be as stiff as possible. In the present project three common ways of tool attachment were therefore used and their influence on wear was compared:

- Traditional screws/nuts
- Quick release
- Magnetic clamping plates

The vibrations of the tool were recorded in-situ with an optical measuring system from GOM, force sensors and accelerometers (see Figure 1).



Figure 1: Tool with markers for optical measurements.

Results

The die clamping situation as the interface between die and press influences both component quality and wear due to oscillations and displacements.

The lever arm between process force and clamping force as the decisive parameter is shortened by the use of quick-action clamps and thus an increase in rigidity is achieved with the same number of clamping devices. The greatest reduction in both tool acceleration and tool vibration is achieved with magnetic clamping plates, which create a rigid connection between tool and press due to the flat force application.

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Project Information

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Partners

