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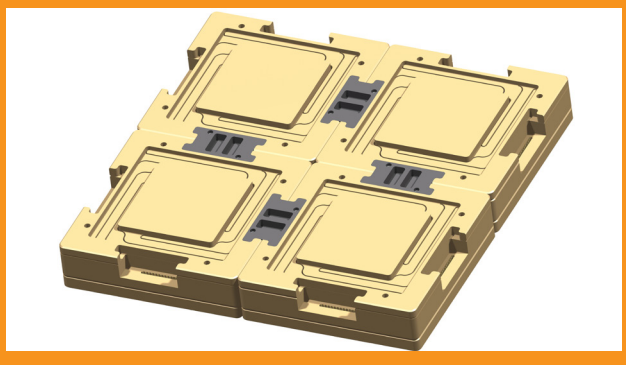

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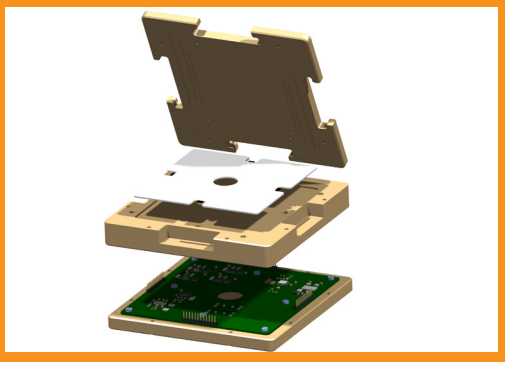

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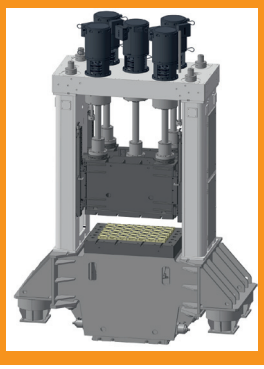

3

1 *Combination of 4 modules*
2 *Detailed view of a single module*
3 *Servo spindle press with measuring modules*

1

MODULAR MEASURING SYSTEM FOR THE FORCE DISTRIBUTION IN FORMING MACHINES

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Motivation

The force distribution in forming tools influences the deep drawing process significantly. This force distribution depends on different factors, e.g. the tool geometry, stiffness in the machine/tool-system and the control of machines with multiple axis.
For the reduction of the try-out process of forming tools as well as the adaption of the force distribution by means of different actuator systems a metrological detection of the distribution is necessary.
To simplify the handling and to increase the flexibility of application specific demands regarding the construction and the setup of the measuring system have to be considered.

Approach

For a wide range of possible applications the measuring system consists of any number of single modules, which are connected mechanically, electrically and electronically. Every single module includes a sensitive element and a electronic subsystem for the data processing.
A communication protocoll assume the data exchange, so the transmission of the measured force distribution to the machine control can be realized via a single master module. Furthermore this master module has the ability of calculating the relative position of all connected modules. This reduces the effort of the setup procedure and allows to visualize the force distribution with different devices in an easy way.
As sensitive elements different transducer principles are feasible.

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