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Multi-axial presses for solid forming

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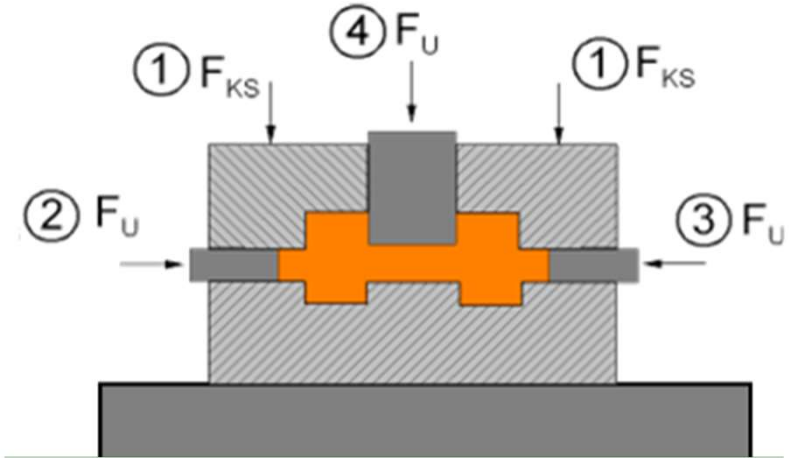
AGENDA

1. Multi-axial forging machines
2. Solutions for multi-axial presses
3. Conclusion
4. Introduction LASCO

Multi-axial forging machines



Forming unit which can be used for multiple forming operations in vertical and horizontal directions, at the same time or separately.

Multi-axial forging machines

Special requirements

- Creation of complex geometries
- Components with little material input
- Components with undercut
- Use of split tools
- Replacement of conventional processes with high flash content and material loss

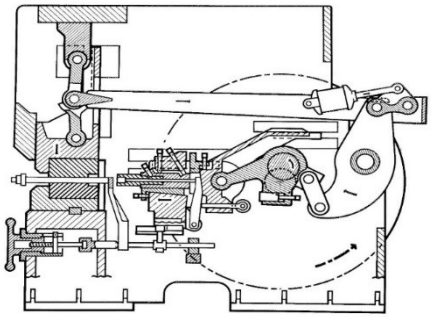
Multi-axial forging machines

Mechanical connection between clamping and main drive.

Mutual interference of the drives.

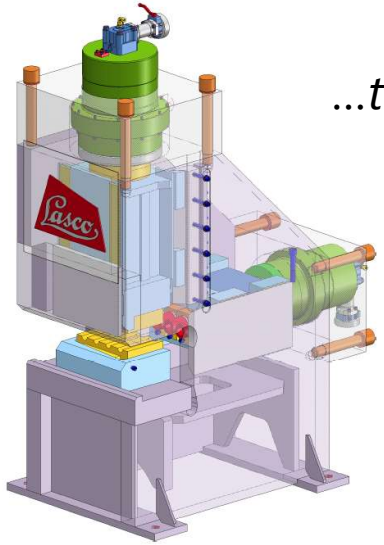
Difficult to automate.

from history...



Quelle: Etchells

...to now



Independent hydraulic drives.

Easy to automate, also for long pieces.

Use of split tools – complexe workpiece geometries.

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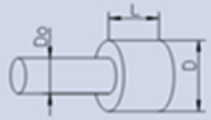
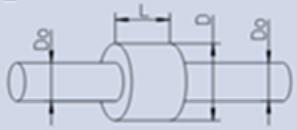
Multi-axial forging machines

Possible preform geometries

VF1

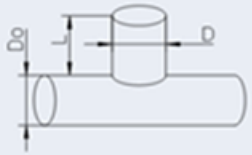


VF2

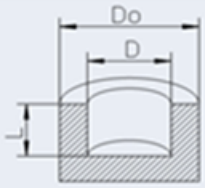


VF3

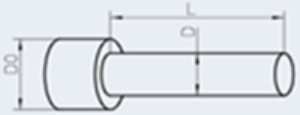
VF4



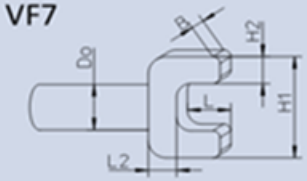
VF5



VF6



VF7



LFM

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LASCO solutions for multi-axial presses

Hydraulic multi-axial presses:

- **HWS (2 axes)**
- **"FlexiMat" (3 axes)**
- **Special multi-axial machines**

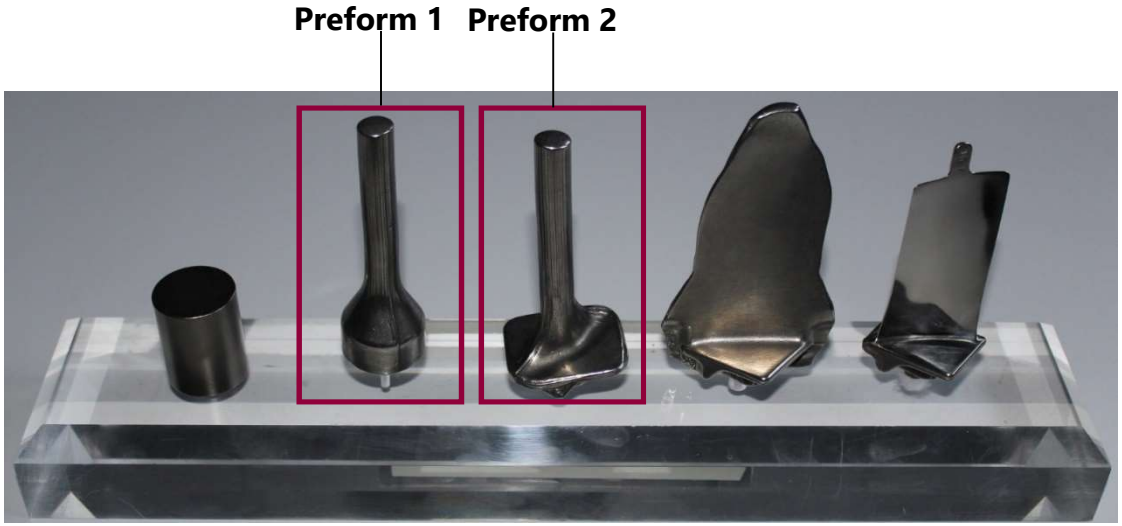
Hydraulic multi-axial forging machine HWS

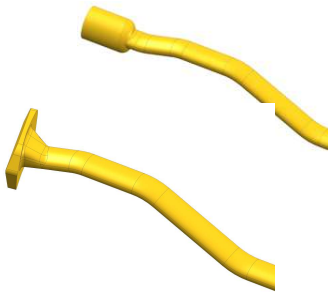
Hydraulic drive for upsetting and clamping

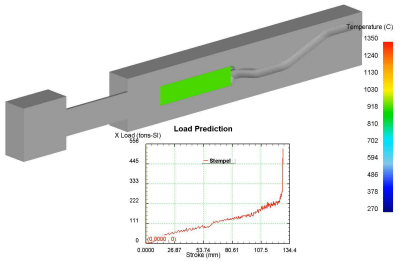
- **Both axes independed drives**
- **Flexibility in hydraulic drive concept**
- **Flexibility in process design**
- **Sensitive control system**

Applications of multi-axial machine HWS

Preform of a turbine blade with shroud produced with a LASCO HWS







Quelle: Leistritz

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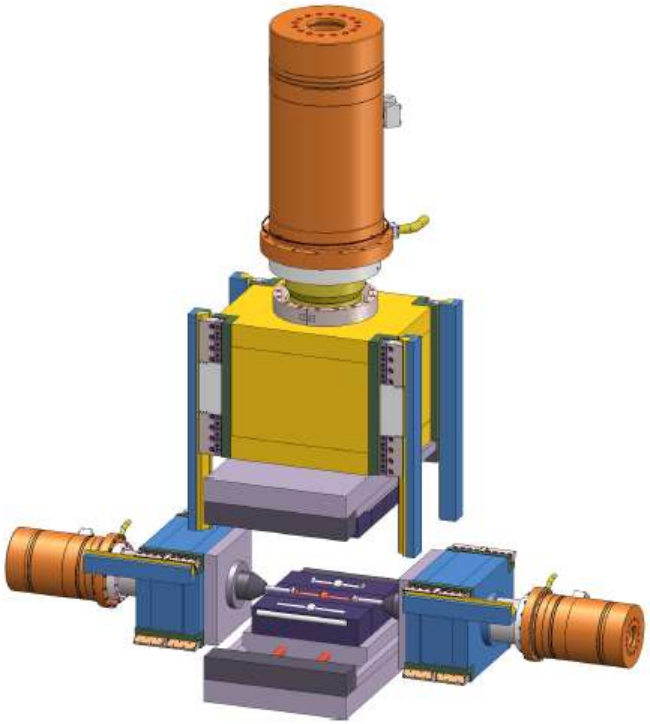
Applications of multi-axial machine HWS

Axle shaft with spline produced with a LASCO HWS

Hydraulic mulit-axial press MAP "FlexiMat"



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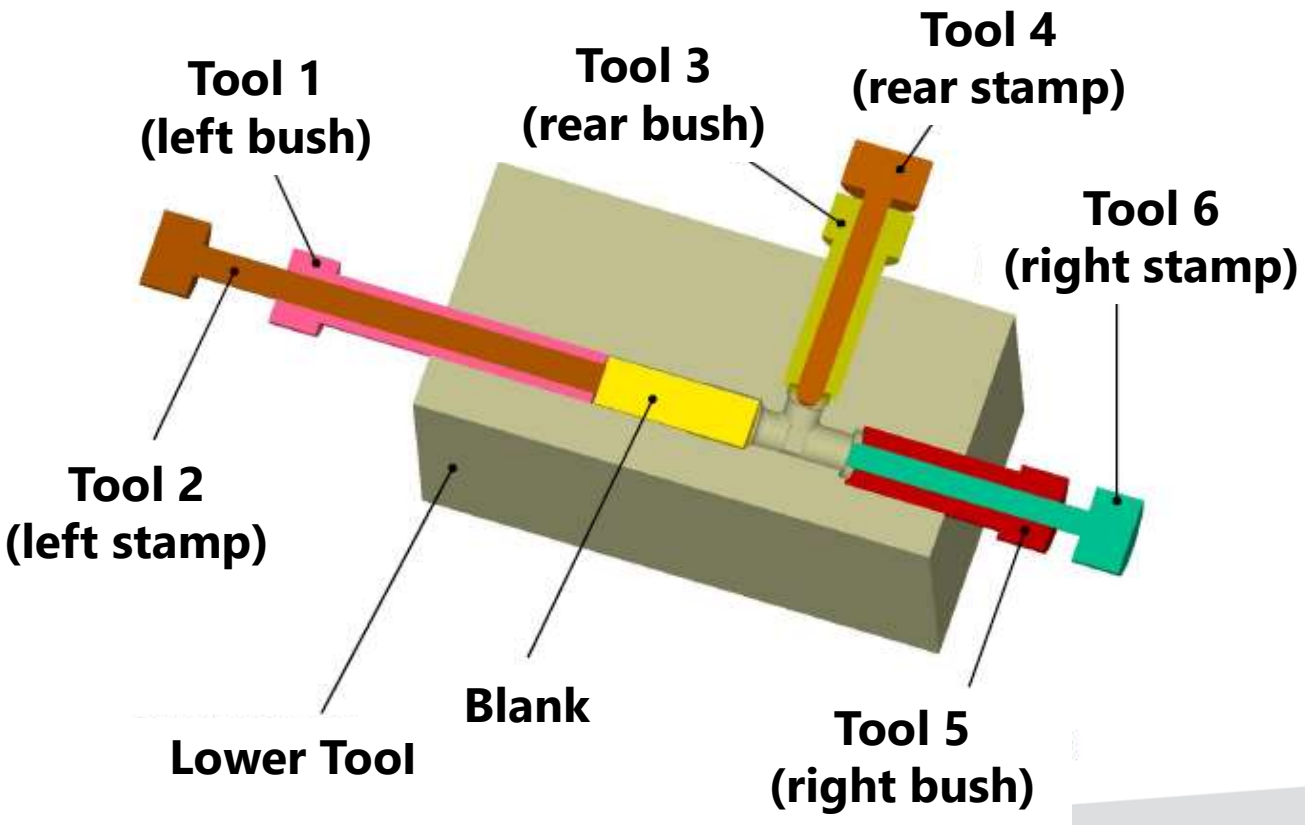
Proposal for tool design "FlexiMat"



Tube fitting

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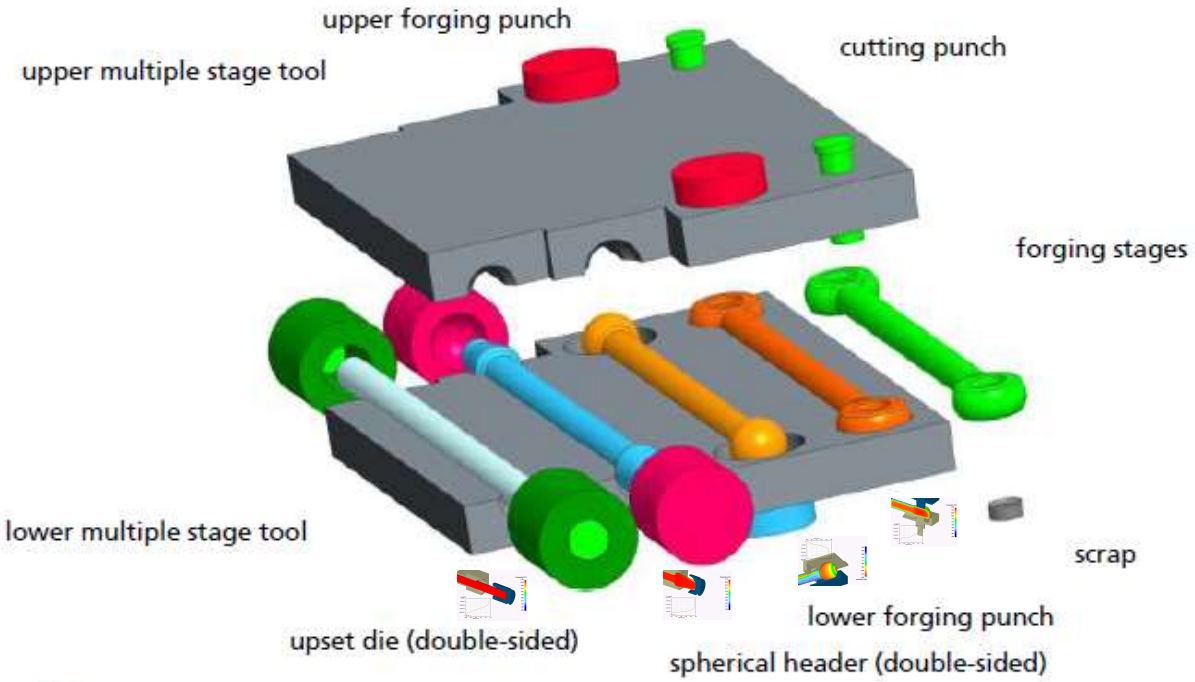
Proposal for tool design "FlexiMat"



Shackle

Stabilizer

Fraunhofer IWU

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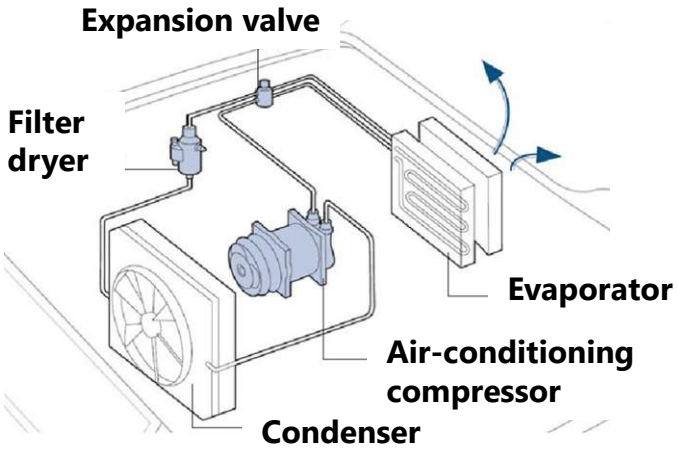
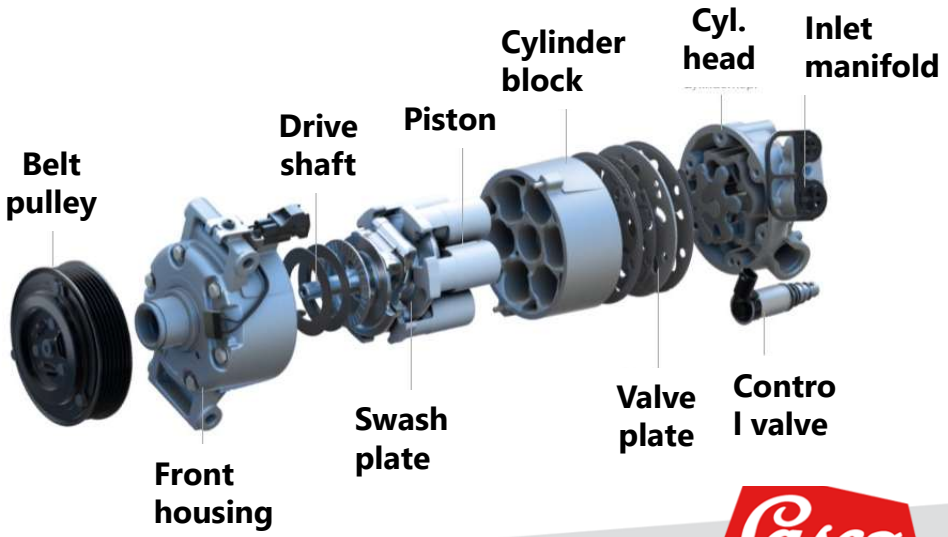
Applications of multi-axial press "FlexiMat"

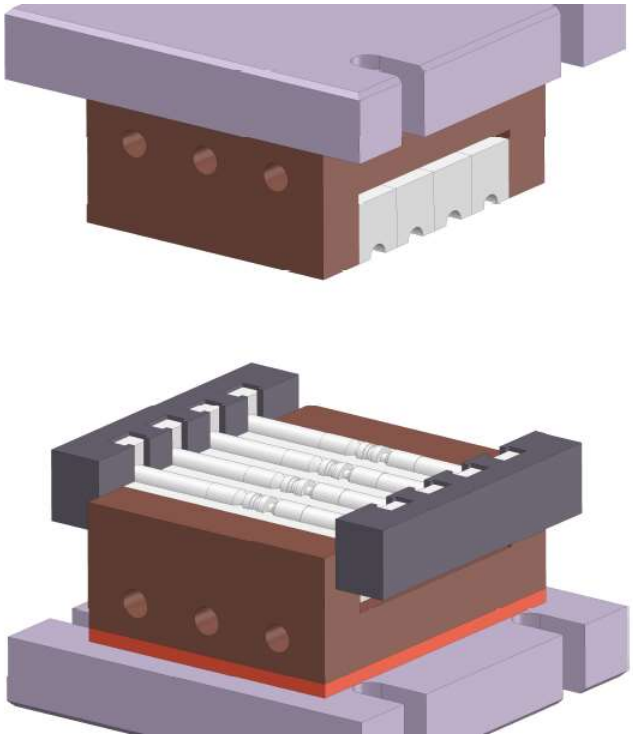
- **Multi-stage toolings**
- **Fast cycle time (12 sec. -> 4 double parts -> cycle time per double part = approx. 3 sec.)**



Quelle: www.mpulse.mahle.com



Proposal for tool design "FlexiMat"



Tooling for 4 double parts

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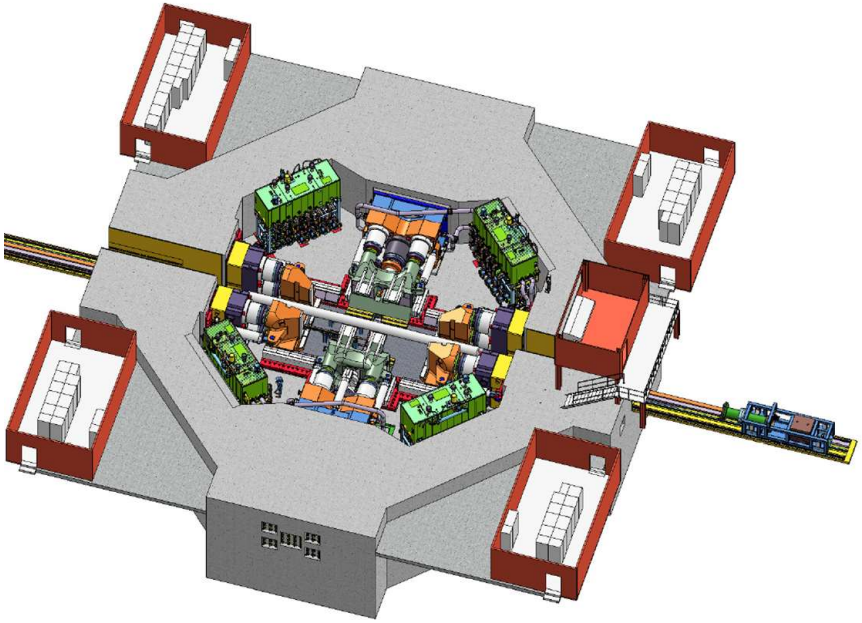
Hydraulic multi-axial press CSPC 31000

- Press force 31,000 tons
- Connected load 10 MW
- 41 independent hydraulic axes
- 39 hydraulic pumps
- 39 servo motors
- Tensioned concrete foundation
  36 m diameter



Part weight : max. 50 tons
Part length : max. 15 meters
Part tolerance: +/- 2 mm

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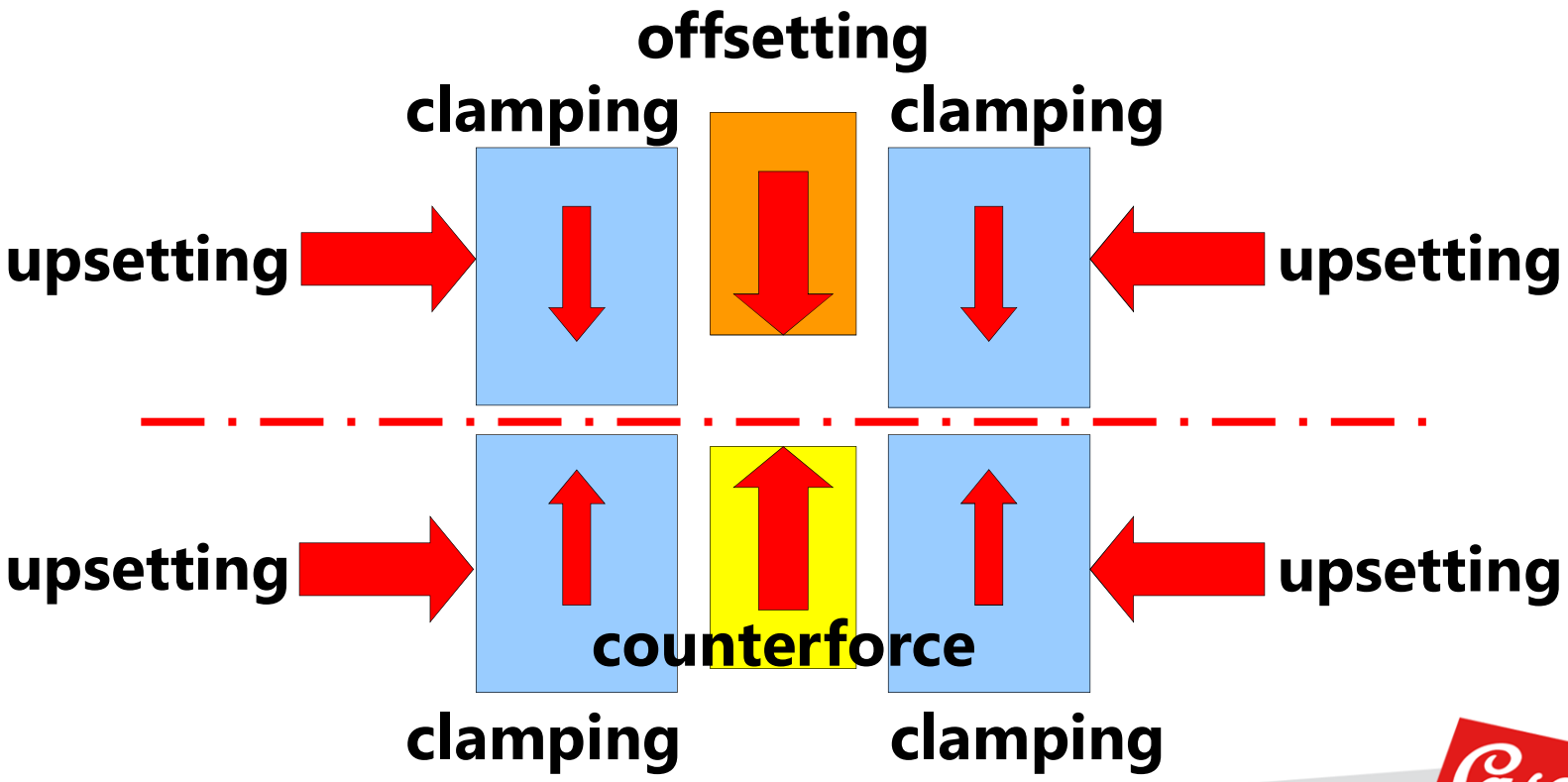
Hydraulic multi-axial press CSPC 31000

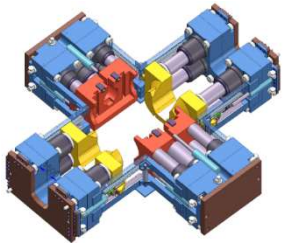


Conclusion

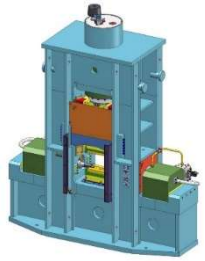
Multi-axial LASCO presses:

- **Suitable for all materials**
- **With conventional hydraulic or servo drive technology**
- **Support to reduce the use of materials**
- **Can be configured individually**
- **Suitable for mass production**
- **Optimized for automation**
- **Optimized for 4.0 integration**

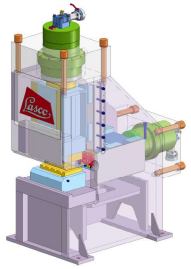
CSPC



"FlexiMat"



HWS



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POSSIBLE APPLICATIONS FORMING TECHNOLOGY

Cross-sectoral






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Your needs. Our solutions.

- Mechanical engineering in solid and sheet metal forming
- Machines and lines for the production of building materials
- Automation technology
- Special machine construction

Headquarters in Coburg, Bavaria, Germany

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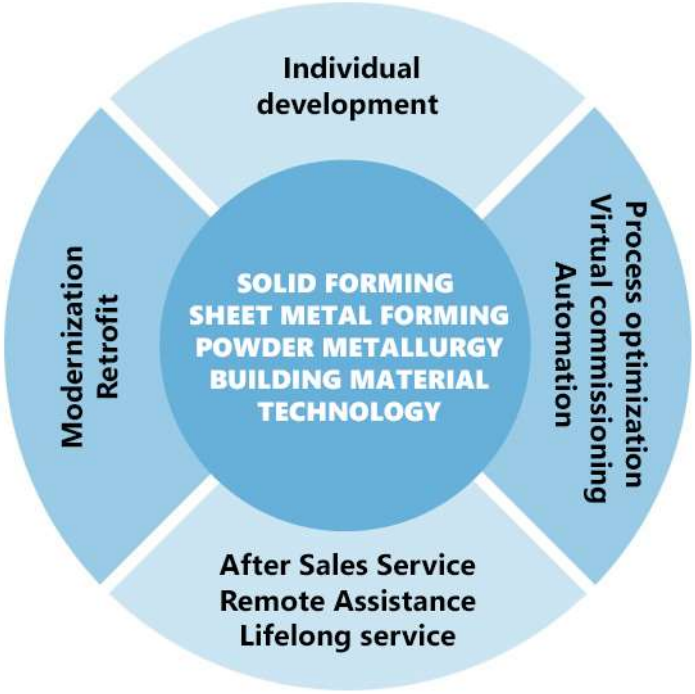
COMPETENCIES

Why we are technology leaders



LASCO aluminium forging line

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PRODUCTION LINES

Hydraulic forging hammers

HO-U GH

Screw presses

SPR SPP

Hydraulic presses for solid forming

VPA/VPE VPZ KP KFP TP

Multi-axial presses for solid forming

MAP HWS

Rolling machines

QKW RCW AVQ STW

Preforming machines

AR AR-D

Presses for sheet-metal forming

TZP

Multi-presses for sheet-metal/ solid forming

MXP

Electric upsetters

EV EH

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