

*Machines for  
solid metal forming*

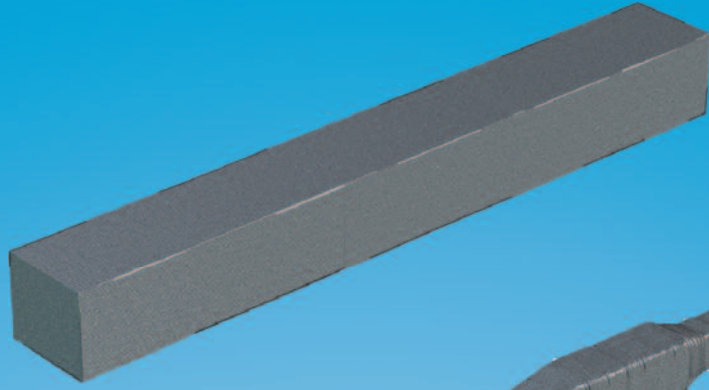
# Fully automatic stretching unit



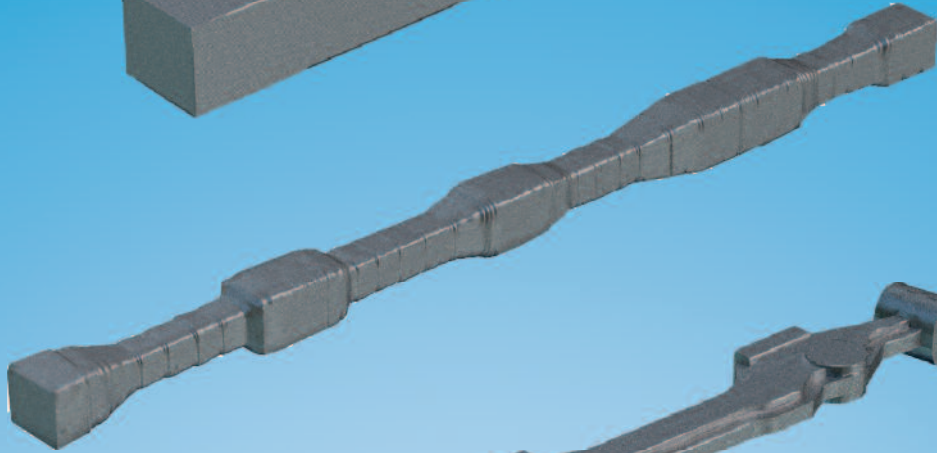
**LASCO UMFORMTECHNIK**  
**WERKZEUGMASCHINENFABRIK**



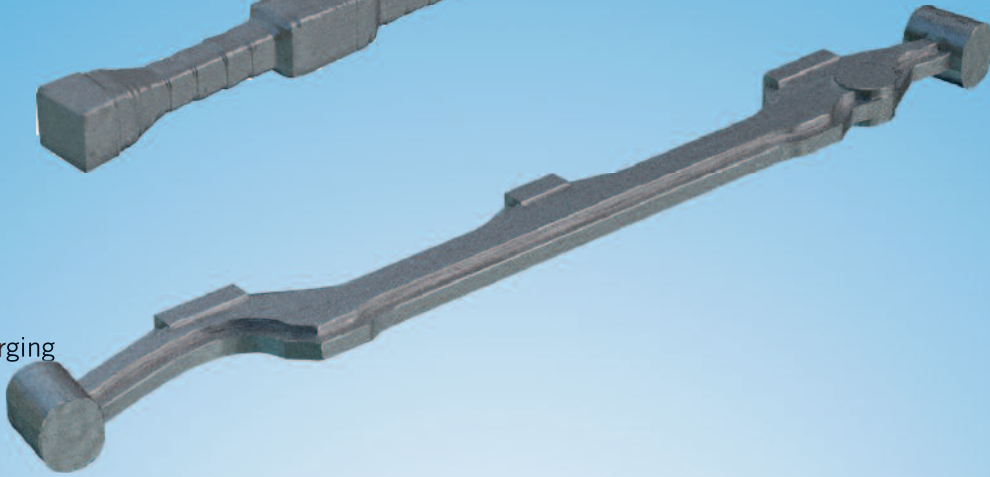
Billet  
(bundle material)



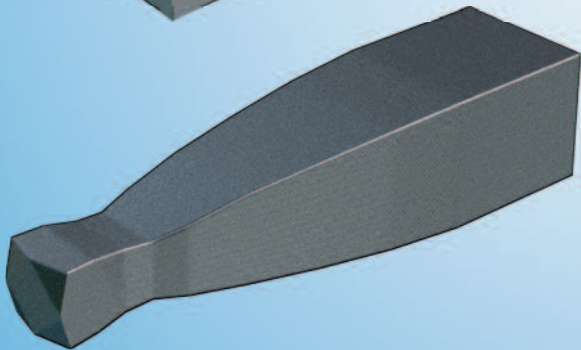
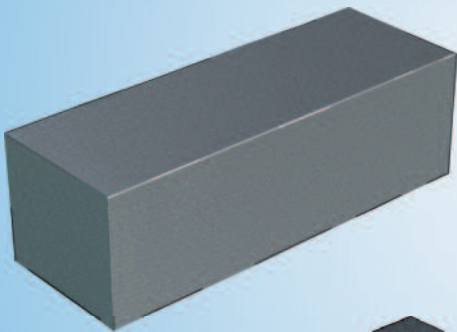
Pre-form



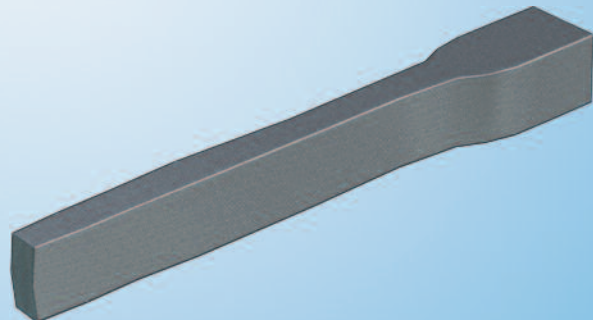
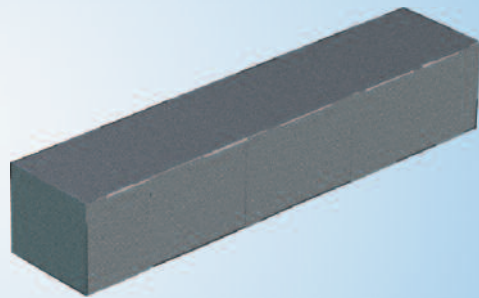
Finished forging



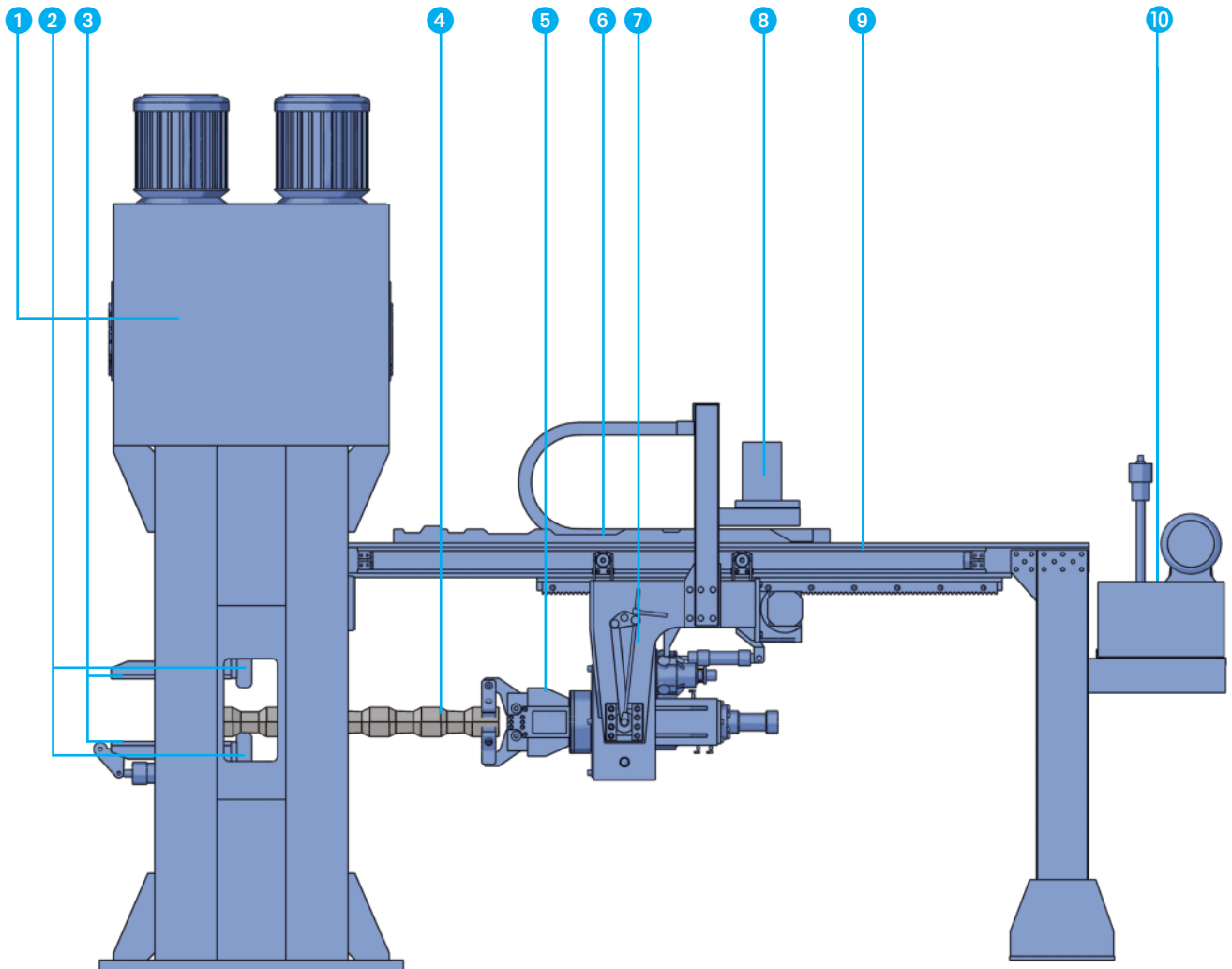
Example: forming of cone



Example: flat forming



## Fully automatic stretching unit AR



- 1 Electro-hydraulic multi-purpose press with high pressing speed.
- 2 Stretching tooling with option of shifting device.
- 3 Levelling plates for adjusting the position of the free end of the work-piece during the stretching operation, with retractable roller conveyor for delivering the billet.
- 4 Work-piece.
- 5 Rotating tongs with hydrostatic drive.
- 6 Templates  
Templates may be used for larger batch sizes as an alternative to selecting the stretching contour on the screen.
- 7 4 speed manipulator carriage with hydrostatic drive.
- 8 Hydraulic control block.
- 9 Fabricated carriage.
- 10 Complete hydraulic power unit.

# Hydraulic multi-purpose press with robust stretching manipulator

## Main advantages:

- High pressing speed.
- High stroking rate (at least 60 spm. including manipulating time).
- Reliability, long service life and low maintenance requirements due to extremely robust construction of the manipulator, which features hydraulic overload protection.
- Ease of access and simple design of manipulator, especially suspension system, clockwise rotation, and choice of 4 speeds for horizontal movement.
- High approach speed.
- Automatic process eliminates requirement for operator.
- Tool costs are minimised by simple, universal stretching dies.
- Stretching dies may be adapted for shearing operations.
- Rapid change-over time.
- Distortion of free end of work-piece eliminated.
- Stretching profile generated and optimised by the use of computerised CAD-software or exchangeable templates.
- Stretching programs may be stored in memory.

## Design

The unit comprises a hydraulic multi-purpose press with a manipulator. The press is of standard Lasco design with high pressing speed. The stroking rate depends on the forming work and a rate of at least 60 strokes per minute, including manipulating movements, may be achieved.

The manipulator is suspended from a gantry and comprises tongs with an elastic levelling device, rotation mechanism, counterbalance, carriage with

linear drive, mounted on a frame with guide rails, and hydraulic drive.

Two hydrostatic drives are included, one for moving and the other for turning the manipulator. 4 different speeds may be selected for the longitudinal backward and forward movement. All major components are mounted on hydraulic shock absorbers, to protect against shock loading generated by arduous forging operations.

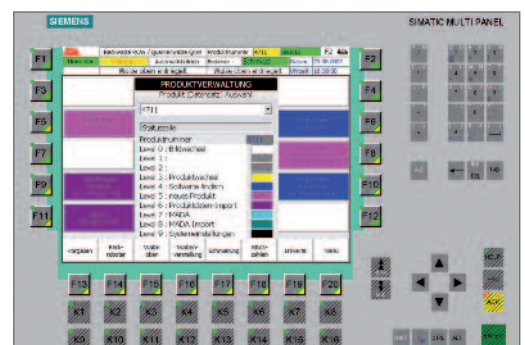


AR 160 stretching press for the production of pre-forms for truck axles.

## Part configuration and product data administration

Nominal values for a required part contour are calculated with a PC, by means of CAD software adapted to the special requirements of the stretching line.

The system facilitates simple and interactive preparation of pre-form data via keyboard and graphic screen. Completed programs may be stored automatically. Before designing a new part, a file name, product description and the name of the programmer should be entered.



Product data administration screen.

## Process reliability enhanced by simple programming

Stored programmes may be listed on the screen or printed out. When designing a new pre-form which is similar to an existing contour, the existing programme may be copied and developed into the new pre-form with few modifications.

Before production commences, the programme is transferred to the machine control screen, permitting call up and input of all relevant data. Modifications which may be necessary during production are able to be carried out at the computer without any further measures.

The control system offers the ability to analyse raw material sectional variations along the total length after determining the weight automatically and to transfer data to the machine control.

As a result, the penetration is compensated according to the given tolerance in order to achieve pre-forms of constant lengths.

### Template control option

As an alternative to control via programs, templates may be used to control press and manipulator. The template profile corresponds to the shape and size of pre-form to be forged. This may be advantageous for the operator who

is able to generate the optimum shape of the part to be stretched.

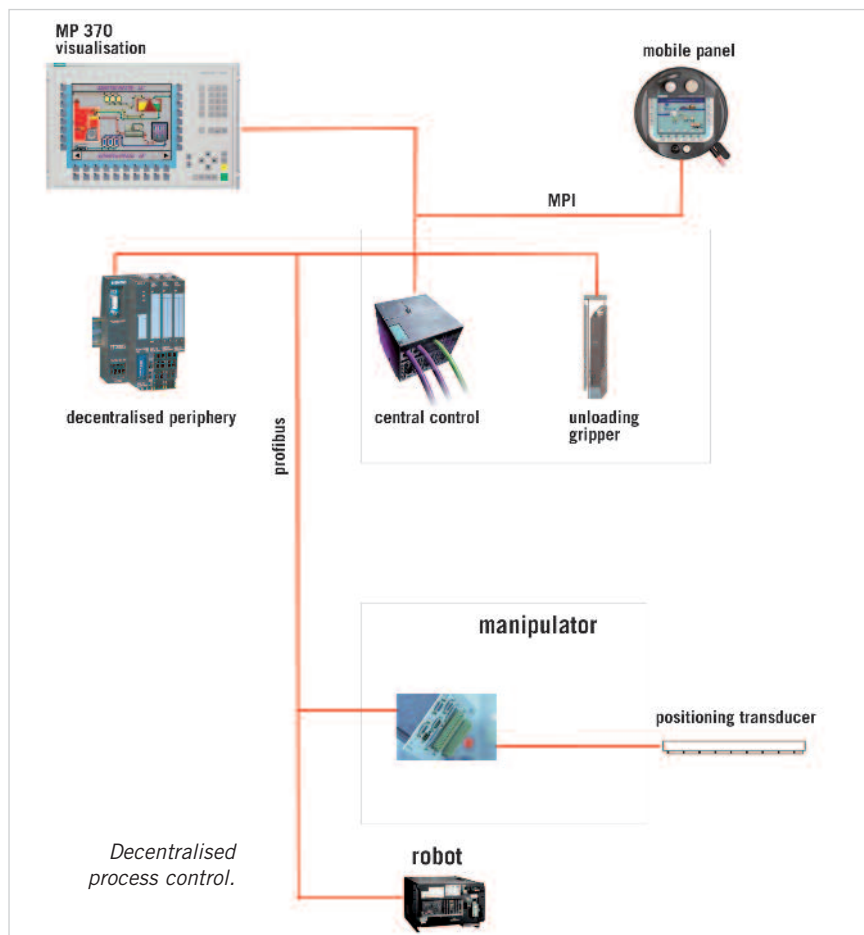
### Process cycle

Round or square billets are delivered to a position where they are able to be picked up and gripped by the manipulator tongs.

The operator signals cycle initiation, and in automatic mode, the press and manipulator cycle in turn according to the selected program. After each press stroke the pre-form is rotated, always clockwise, and advanced through the stretching dies.

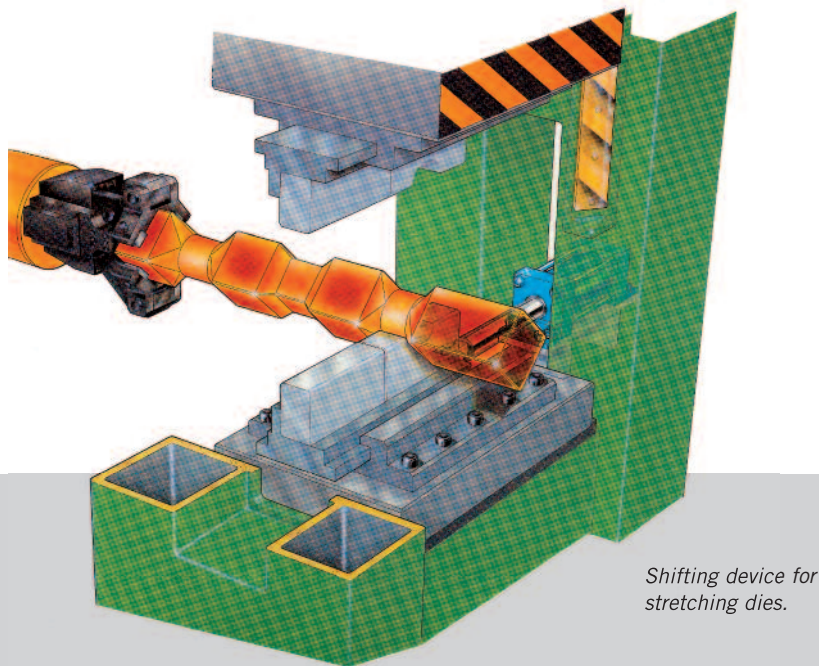
Billet sections which require no deformation are advanced rapidly by the manipulator through the dies. For parts requiring flattening in some sections, rotational movement ceases during pressing along this section. Guide plates on the press prevent excessive bending of the billet during forming, ensuring component straightness.

At completion of the pre-forming process, the manipulator quickly transfers the part out of the press die area, and places it in a position from where it will be delivered to the finish forging machine, with minimal heat loss.





## Low cost long life tools



*Shifting device for stretching dies.*

### Shifting device for stretching dies

Stretching dies with varying profiles may be utilised in conjunction with the shifting device, permitting the production of forms with varying cross-sections. The stretching die may also be used for shearing the end portion of the billet.

Pre-forms for a wide range of die forged components may be produced with the AR automatic stretching unit, including front axle beams for trucks, automotive crankshafts, steam turbine blades, railway hooks and axles, drive shafts, etc.

### Comparison between stretching and rolling

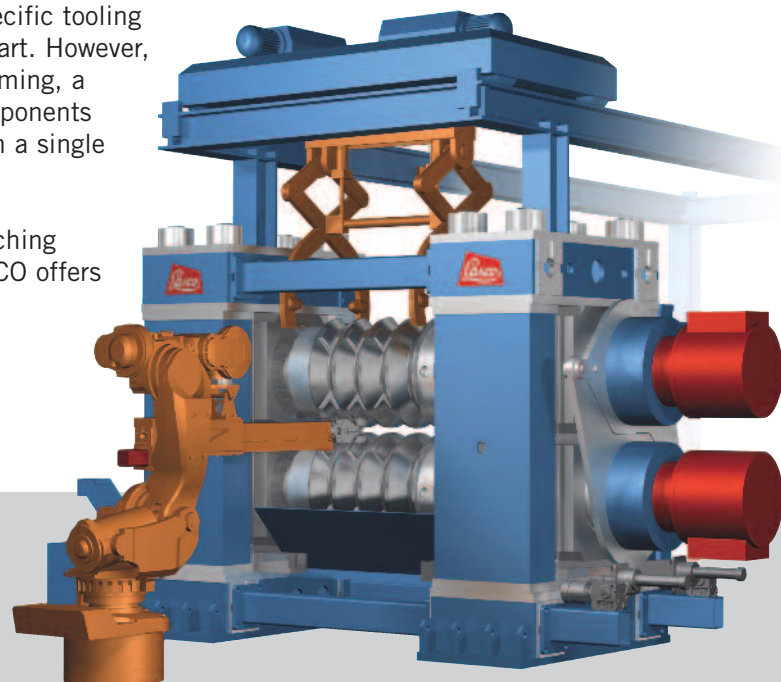
The advantages of stretching compared to rolling are simple, low cost tools with long life.

Rolling techniques are preferred to produce small to medium-sized pre-forms from billets in large quantities, with specific tooling required for each part. However, with stretch pre-forming, a wide variety of components may be formed with a single set of simple dies.

In addition to stretching forming units, LASCO offers

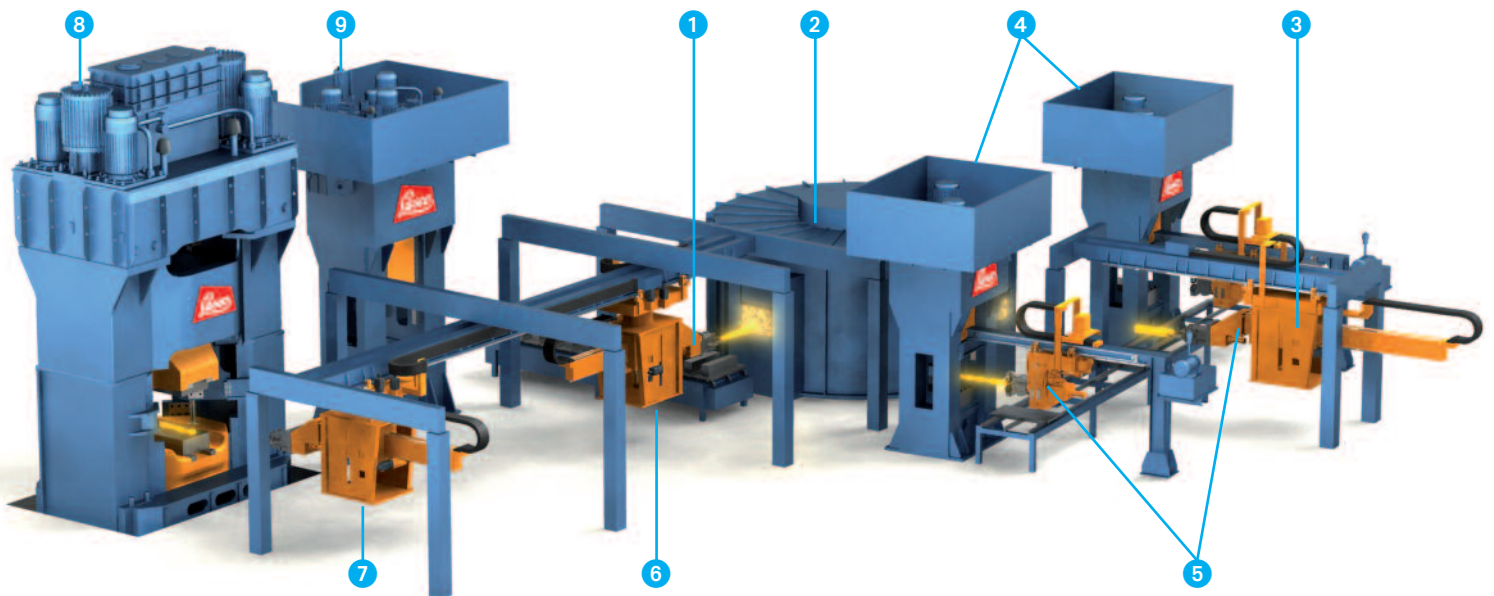
cross wedge and forging rolls (please refer to our brochure "Cross wedge and forging rolls").

The choice of machine depends on batch sizes and cross section of the raw material.



*Schematic representation of a LASCO RCW 900 forging roll with manipulator.*

## Extremely economical and versatile



- |                                |  |
|--------------------------------|--|
| 1. Bundle separator            | 6. Manipulator I                                   |
| 2. Rotary hearth gas furnace   | 7. Manipulator II                                  |
| 3. Furnace loader /un-loader   | 8. GH 4000 Counterblow hammer (400 kJ blow energy) |
| 4. VPA 250 Multi-purpose press | 9. VP 1600 Forging press (16,000 kN press force)   |
| 5. Manipulator Ma 100          |  |

### Forging line for truck front axles

The installation depicted was designed for flexible and economic production.

Billets are unscrambled at position 1 and loaded into the rotary hearth gas furnace by manipulator I. Billets heated to approximately 1.100°C are unloaded from the furnace and processed through the AR stretching press.

After being re-heated to forging temperature, the stretched pre-

form will be taken by manipulator I and transported to the forging presses. Two multi-purpose presses are required to satisfy the required output.

Finally, the bent pre-form is transferred by manipulator II, to the counter-blow hammer for finish forging, and then returned to second multi-purpose press for trimming the flash.

## **www.lasco.com**

### Headquarters:

LASCO Umformtechnik GmbH  
Hahnweg 139  
96450 COBURG  
GERMANY  
Phone +49 9561 642-0  
Fax +49 9561 642-333  
E-mail lasco@lasco.de  
Internet www.lasco.com

### LASCO FRANCE

1, allée des Cèdres  
78860 SAINT NOM LA BRETÈCHE  
FRANCE  
Phone +33 1 3080-0528  
Fax +33 1 3080-0584  
E-mail thierry.lebailly@lasco.de

### LASCO USA

LASCO Engineering Services L.L.C.  
615 Harbor Avenue  
MONROE, MI 48162  
USA  
Phone +1 734 241-0094  
Fax +1 734 241-1316  
E-mail lasco@lascoUSA.com  
Internet www.lascoUSA.com

### LASCO CHINA

LASCO (Beijing) Forming Technology Co. Ltd.  
Huateng Tower, Unit 1706A  
Jia 302, 3rd Area of Jinsong,  
Chaoyang District  
100021 BEIJING  
P.R. CHINA  
Phone +86 10 8773 0378  
Fax +86 10 8773 0379  
E-mail lasco.beijing@lasco.de