



**YOUR PARTNER FOR
LASER SYSTEM TECHNOLOGY**

**LASER WELDING SYSTEMS
FOR GEAR WHEELS**

Laser Welding with External, Automated Processes

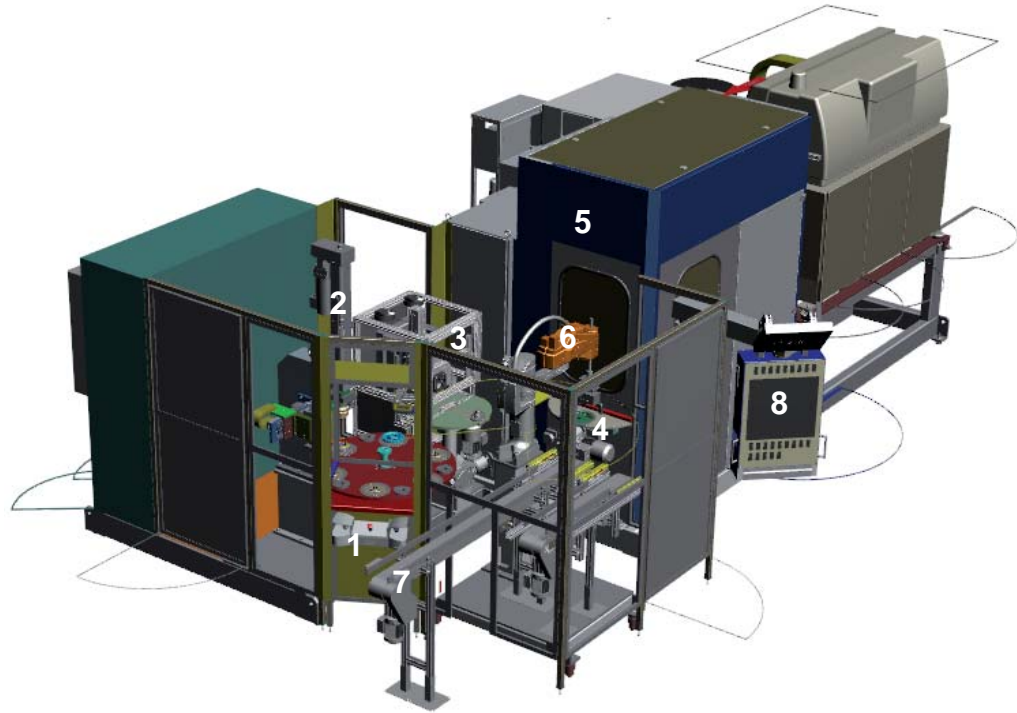
Our new laser welding system fully automatically links additional processes, such as pressing and heating the components, with the laser welding operation.

Online process control during the laser welding process and the optical recess detection function facilitate quality assurance and serve to continuously monitor the welding seam.

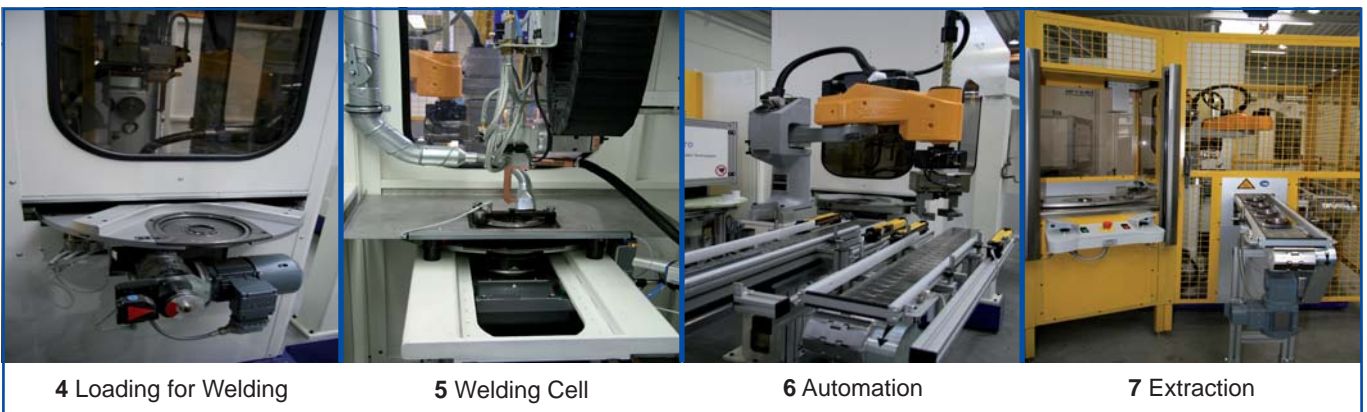
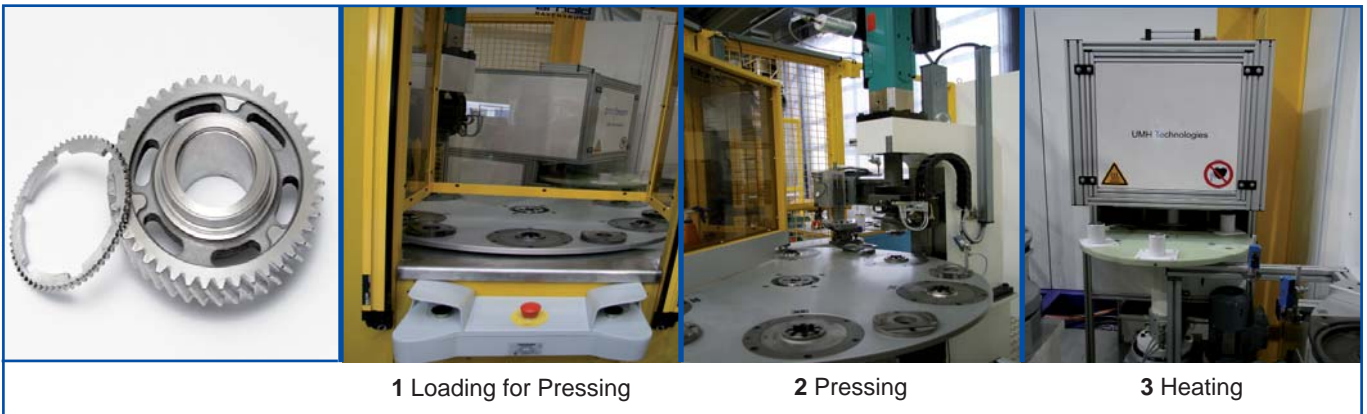
Finished (OK) components are picked up by a handling robot and placed on the discharge belt, while faulty (NOK) parts are put down on a separate belt.

The cycle time is between 16 and 22 seconds.

The welding cell can be operated with a CO₂ laser or, with a slight modification, with a solid state laser.



Process sequence:



Components and Functions

The components and functions described here comprise the prerequisites for the customer's requirements.

1 Loading

Manual, or alternatively, automatic loading of the components.

2 Pressing Station

Pressing the synchroniser rings and gear wheels with a pneumohydraulic servo axis.

Press force: 5 t. Automatic extraction and guidance of the synchroniser rings.

3 Heating Station

(UMH: Uniform Magnetic Heating)

The alternating magnetic field heats the components to approx. 160° in less than 10 seconds.

4 Welding Cell Loading Postion

Rotary table with interchangeable workpiece holders.

5 Laser Welding Cell for CO₂ Laser

Beam guidance using Arnold welding head.
Component transport with rotary table.

Clamping technology specially developed for rotationally symmetric components: the workpieces are pneumatically pressed against a synchronised rotating counter bearing during the welding operation.

6 Automation

The components are transported to the individual stations by a Scara robot. The central positioning of the robot ensures short traversing paths and cycle times.

7 Extraction of the Finished Components

Manual, or alternatively, automatic extraction of the finished components.

8 OP 012 Operator Panel

The Siemens 840 D SL, as the superordinate control unit, manages, controls and monitors all processes.

Additional Components / Scope of Delivery

- Discharge / NOK belts
- Camera for monitoring the position of the synchroniser rings
- External protective guard



Expandability and Special Features:

- Fully automatic execution and monitoring of all machining processes
- Status monitoring of the components at each station
- Automatic detection and sorting of faulty (NOK) parts



● Modular System

- Expansion modules and processes can be integrated
- Variable layout for the additional modules
- Welding system can be used with CO₂ laser or solid state laser

- Welding process monitoring by optical sensor
- Automatic recess detection
- Optical gear teeth interlock monitoring of the synchroniser rings

Technical Data:

Traversing paths

X = 650 mm

Y = 320 mm
(manual)

Z = 300 mm

C: n x 360°

W: 100 mm
(pneumatic)

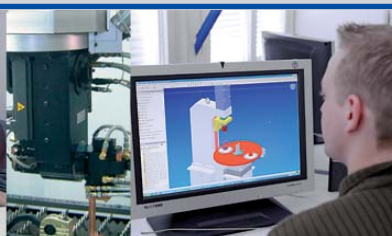
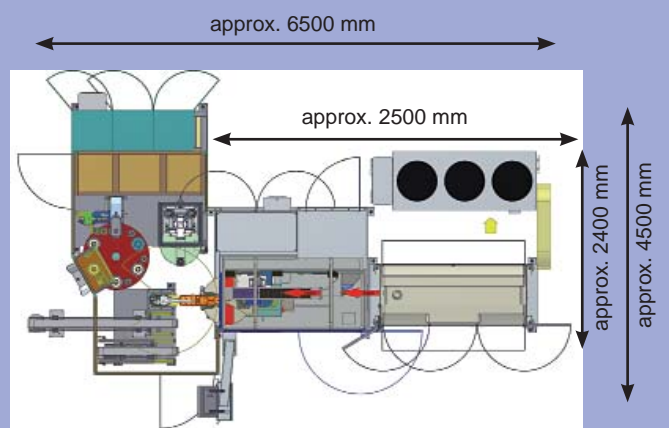
Dimensions (L x W x H)

Complete system:
6500 x 4500 x 3000 mm

Welding Cell:
2500 x 2400 x 3000 mm

Component (max.):
∅ 250 mm, height 60 mm

Control unit: Sinumerik
840 D SL



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