Industrial competence: Industrial vehicle industry

Solutions for automated welding and cutting
in industrial vehicle manufacturing

CLOOS

Weld your way.

www.cloos.de

"Strength lies in quality."

Friedrich Nietzsche

Content

We understand your business

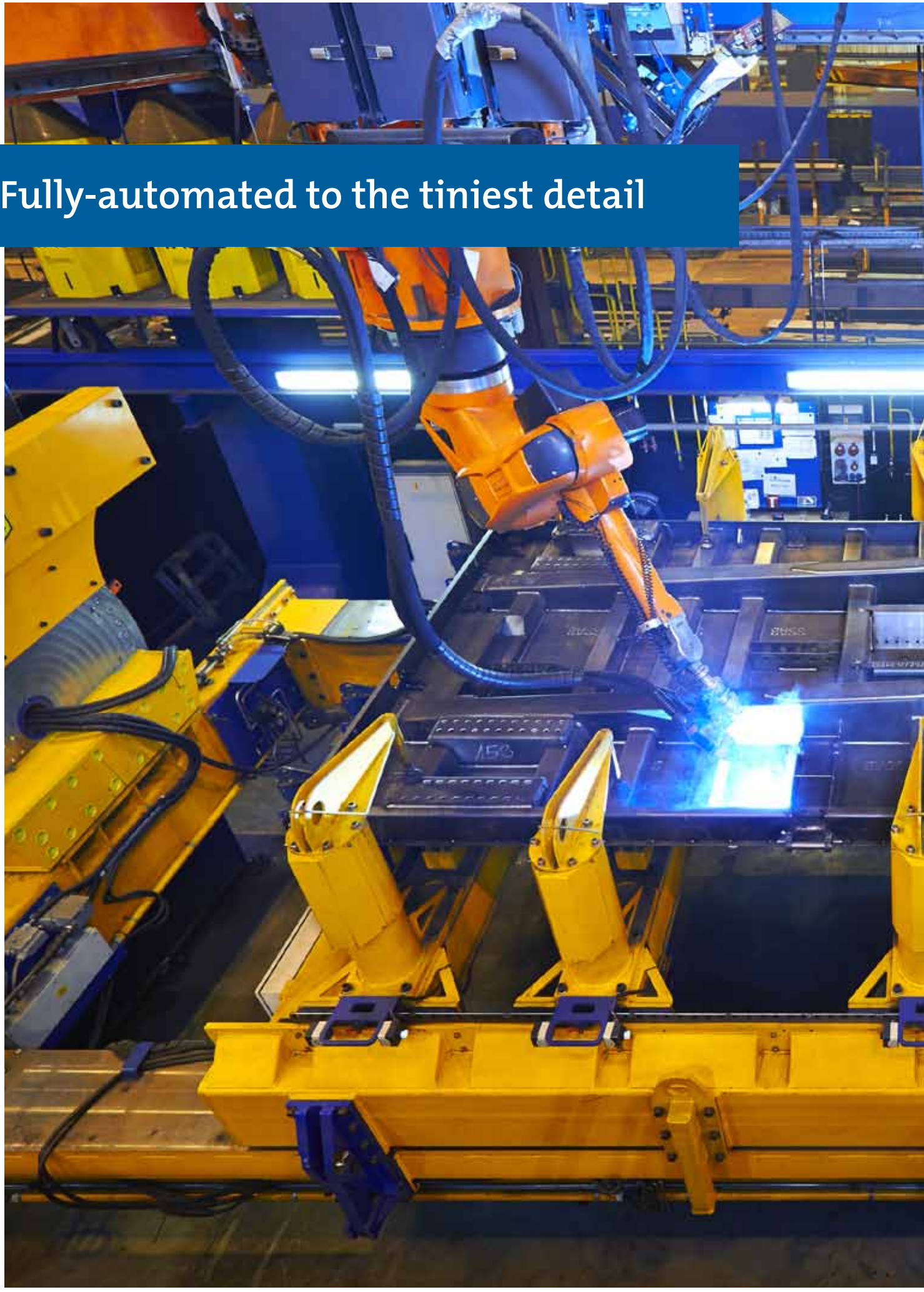
In the past, lightweight design played a special role in the automotive industry, but now weight-reducing measurements are also in demand of the industrial vehicle industry. Payload optimised lorries can transport more freight, save fuel and relieve the load on the traffic network – and here the lightweight design results in enormous increases of efficiency.

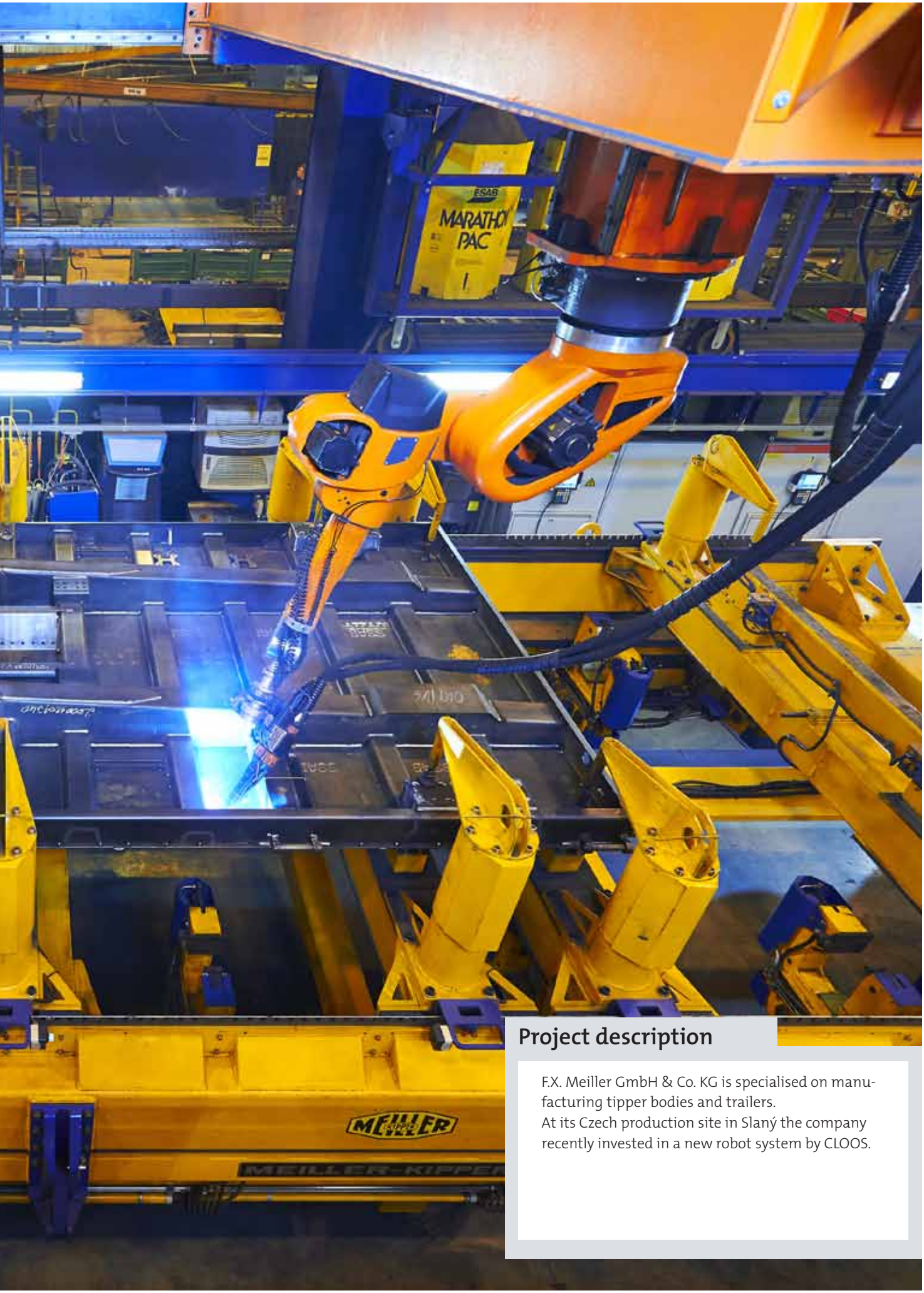
Some developments and concepts of the automotive sector can be applied to the industrial vehicle production, too. So, the use of components made of aluminium, steel, high-strength steel in different quality classes and new alloys increases. With an intelligent material combination, the manufacturers of industrial vehicles are able to save weight and create more efficient production processes. At the same time, they must withstand extreme conditions and loads.

With these increasing requirements for the production of industrial vehicles, the joining process is of particular significance. An efficient assembly process without reworking can only be achieved by compensating for component tolerances and minimising distortion through low heat introduction in the welding process. Ensuring cost-optimised production of the often large-volume components also requires networked CAD design and programming systems and auto learning robot and sensor technology.

With highly innovative products we work out individualised solutions to meet the growing requirements of the industrial vehicle industry.

Fully-automated to the tiniest detail





Project description

F.X. Meiller GmbH & Co. KG is specialised on manufacturing tipper bodies and trailers.
At its Czech production site in Slaný the company recently invested in a new robot system by CLOOS.

MEILLER rear tipper "Classic" for MAN TGS bogies with front telescope cylinder, stable floor construction and scissor-type tipping stabiliser

Project description

Meiller produces tipper body sub-frames for three-way tippers, tipper bodies for rectangular rear tippers and half-pipe tipper bodies for rear tippers and semitrailers in three-shift operation.

The system consists of three working stations: A, B and C. Two six-axes QRC 350 robots with a working envelope of max. 4,400 mm are used. The welding process is MAG Tandem. In addition, the robots are equipped with three sensors (tactile sensor, arc sensor and online laser sensor). Due to the 33 m long gantry the two robots can reach all stations.
Tipper bodies for rear tippers are welded in Station A. Tipper body sub-frames for three-way tippers are welded in Station B and Station C is for the welding of smaller assemblies such as rear walls.

At the Slaný site the tipper bodies for rear tippers, three-way and two-way tippers are produced and later exported to Europe and Asia.

A changing system allows the two six-axis QRC 350 robots to weld with the MAG Tandem and the single-wire process.

The system comprises three workstations which are arranged in a line. Thus the processing time during production is reduced considerably.

Highlights

- **Fully automated production** also in 3-shift operation
- **Maximum system flexibility** with changing the component dimensions
- **Outstanding welding quality** due to the use of laser sensors
- **High accessibility** with a working envelope of 4,400 mm diameter
- **Highest productivity** due to the high deposition rate of the tandem process
- **Creation of robot programs** during production with the RoboPlan offline programming software
- **Reduction of the production time** by about 50 % with reproducible quality compared to manual welding

The Variopress container with a built-in compaction press and rear loader has a volume of 7 to 30 m³.

Project description

Faun as the most successful manufacturer of waste disposal vehicles in Europe offers customised solutions for the most different waste types. An individual robot system for welding the waste collection containers was designed according to the specific customer's requirements.

The 42 m long floor-mounted linear track is equipped with a vertical and horizontal track and a C frame. Thus the QRC 350 robot can perfectly access the workpiece, particularly in the case of larger components. The workpiece positioner with turning/swivelling movement is designed to position the complex workpiece perfectly for welding.

The QRC 350 robot welds the external seam of the container.

The container is 3 mm thick and Tandem welded.

The different container types are welded in 4 stations which can be operated independently from each other. The completed container meets the highest standards of tensile strength and weld quality and allows an optimum waste compaction.

Highlights

- **Clear speed advantage** with the Speed Weld process at 120 cm per minute
- **Optimum component accessibility** due to the positioner design together with the overhead mounted QRC 320 robot at the C frame and a 42 m long floor-mounted linear track
- **Guaranteed high speed** with a constantly high weld quality due to the Tandem Weld process
- **Flexible adaption** of the system to the workpiece, even in the case of complex components with a weight of up to 4 tons and a maximum component length of 7,500 mm

The Grove GMK4115 mobile telescoping crane with a max. capacity of 100 t, 11.3 m boom length and a boom angle of -1.5° to max. +82°.

Project description

The Manitowoc Group is one of the world's leading crane manufacturers. The US Group produces its GROVE brand auto-cranes at the Wilhelmshaven site. There, CLOOS realised a laser hybrid system for welding and cutting of the booms. The boom parts für mobile cranes which are up to 14 m long are welded from top and bottom shells and drilled.

The CLOOS QIROX robot with its 7 axes is suspended below a gantry which travels along a precise rail system through the 26 m-long cabin. Processing is in the PC position, i.e. at 3 and 9 o'clock, so the boom need not be rotated. Via the automated changing system the robot can access the welding and cutting unit.
A loading and unloading station allows an optimised material flow.

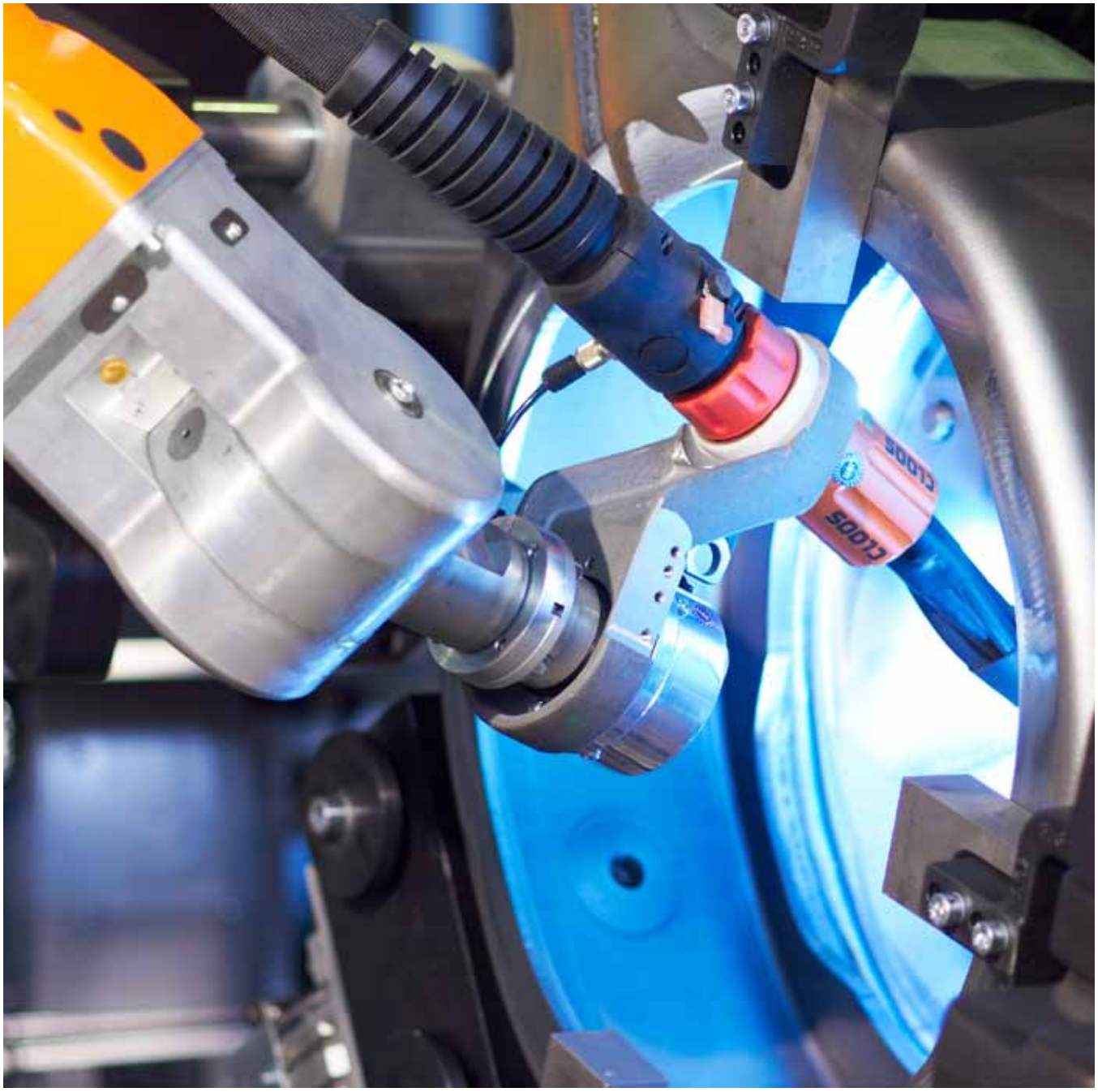
The boom of a mobile crane comprises a main element and up to 6 six telescopic sections, each of which can measure up to 14 m. The lower half is made of a thicker plate than the upper half. High-strength fine-graded steels with material thicknesses from 4 to 15 mm are used to produce the boom sections.

The automatic position marking for the holes is now made 80 % faster compared to manual cutting.

By hand, each hole took 15 min. The laser produces up to 30 holes in the same time.

Highlights

- **Flexible use of the laser,** also for automated position marking
- **Increase of the speed by 150 percent** compared to submerged arc welding when using Tandem Weld **(150 cm/min. Tandem compared to 60 cm/min. submerged arc welding)**
- **Cost reduction** as there is no need of weld pool backing for the submerged arc weld, weld preparation, filler material, powder disposal and welding of several layers.
- **Laser** guarantees very precise and reproducible welding results



The axle components for the voestalpine industrial vehicles meet the highest demands in the field of safety, lightweight design and cost reduction and are characterised by a maximum functionality.

Project description

At their location in Linz, the steel specialist voestalpine weld drive axle casings for industrial vehicles with a chained CLOOS robot system. The complex system consists of four welding stations, two processing stations and seven robots in total. The axle casings are fully-automated moved from station to station by means of a shuttle system.
At the first station two QIROX QRC 350 robots weld the root passes to both sides of the axle casings.

The gap measurement is made by a laser offline sensor. At the second station the cover passes are welded to both sides of the axle casings. At the third station the excess weld is milled off. At the fourth station the interior cover seams are welded. At the fifth station the covers and rings are welded. At the sixth station the axles are cut to length.

The system comprises a total of six stations which are operated by only two workers. The output quantity in 3-shift operation is 75,000 axles. The stations are chained, the components are loaded via a shuttle system.

Measurement of the axle casing by means of a laser offline sensor and then root pass welding to both sides

Welding of the interior cover seams with best accessibility due to the 90° special torch at the QRC 320 robot

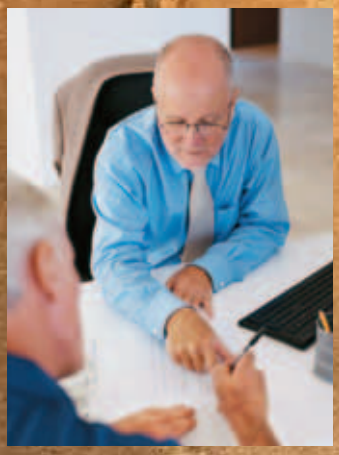
Highlights

- **Meets the highest demands** when welding safety-related components by using laser sensors, test systems and high end technologies
- **Optimum access to component** by shuttle and positioner system
- **Maximum productivity and speed** due to a fully automated and chained processing and welding system
- **Excellent results** when welding under pure CO2 with the CLOOS GLC 603 Quinto
- **Highest precision** at component tolerances by using the latest laser measurement technology and complex positioning systems
- **Measurable quality** because of recording and check of the weld data - live during production

From the idea to the finished component, a whole product life ...

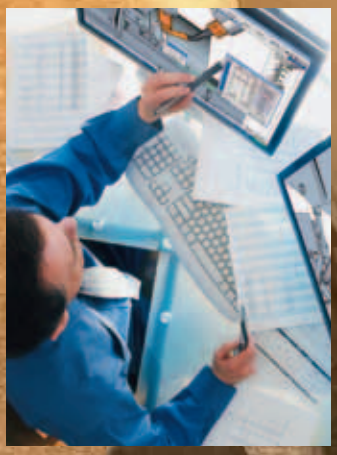
1. Consulting

With this comprehensive “pre-service”, we take care of your project from the beginning and transfer our integrated process expertise to your component.. Thus we ensure you a decisive lead in technology.



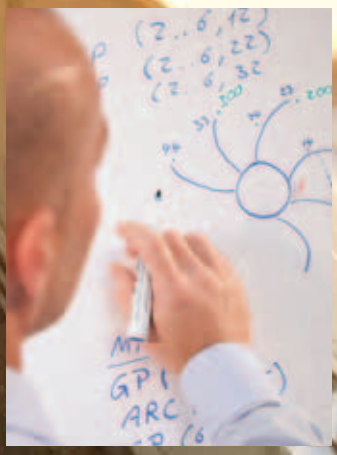
2. Planning

We elaborate a solution which perfectly meets your individual requirements. We work hand-in-hand with our customers to guarantee you on-schedule project processing.



3. Design

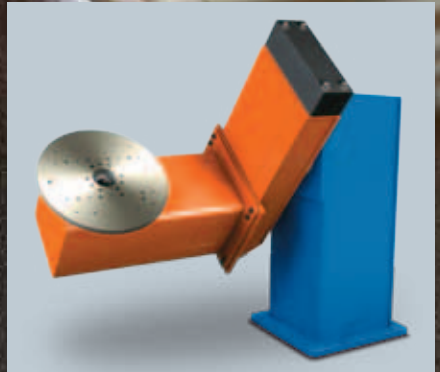
From the cell to the fully-automated production line - due to the modular design of our product series we develop customised solutions which meet all your production requirements.



...with our tried-and-tested products and systems - from a single source!

Robots

Power sources



Workpiece positioner

4. Production

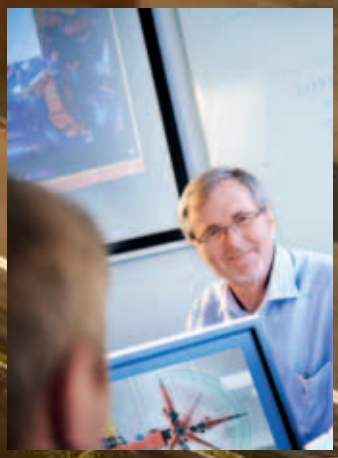
Our production workshops are the core of our company. Welding machine and robot technology is our strength - including our core competence: the arc.

5. Commissioning

Our specialists carry out the installation step-by-step in your production hall and test your system for faultless functionality. In this way, we guarantee a smooth installation and a rapid start of production.

6. Training

We train your employees and service technicians in programming, operation and maintenance in our modern training centre.



7. Service

Our competence team advices you on any extensions, modifications and retrofits of your existing robot and welding systems. We offer complete service packages for inspection, calibration and maintenance.

Sensors

Process software

Machine control system and user interface

Whatever you want to weld...

The right welding technology for your materials

With a large range of proven and innovative welding processes, CLOOS can offer solutions for the future providing maximum efficiency and productivity with regard to automated welding. New processes such as Tandem Weld or Laser Hybrid Weld are developed and tested in our technology centre under practical conditions. Even the proven MIG/MAG welding processes are continuously improved to meet the increasingly complex requirements.

This decisive competence edge is offered only by CLOOS. Excellent ignition behaviour, a quiet and stable arc and excellent weld seam qualities: Eight welding processes allow highly flexible application possibilities with a variety of materials. Clean Start, the ignition routine patented by CLOOS, ensures reliable and low spatter arc ignition with all processes.

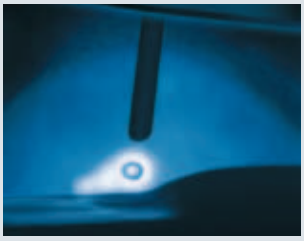
Control Weld

Controlled welding of thin plates

- For thin plates of steel, fine-graded steel, galvanised surfaces
- Root welding, repair welding
- Applicable in all welding positions

Vari Weld

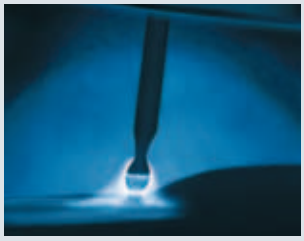
For aluminium welding and MIG brazing



- For steel, CrNi, aluminium,coated plates
- Stable and nearly spatter-free arc
- Smooth weld surface, thus only a minimum of rework

Speed Weld

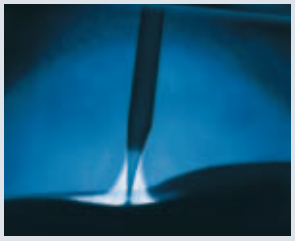
Special process for rapid welding



- For steel, fine-graded steel, CrNi, aluminium
- High welding speeds
- Very good penetration depths
- Optimum side wall joints

Rapid Weld

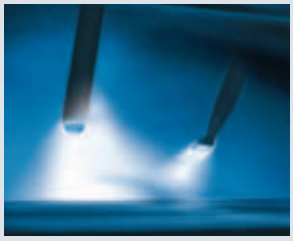
Deep penetration, high deposition rates



- For steel, fine-graded steel, CrNi
- Very powerful and stable arc
- Less preparation and rework
- Reduction of the opening angle and weld preparation

Tandem Weld

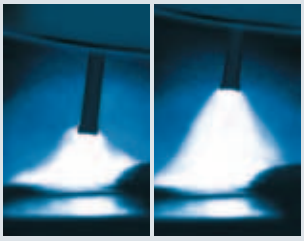
The process for more productivity



- High-performance process for automated welding
- High deposition rate
- High welding speed
- Low heat input

Cold Weld

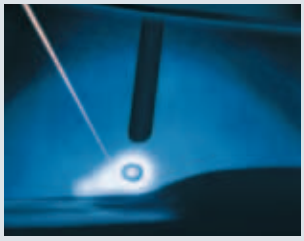
Welding with minimum heat input



- For steel, CrNi, aluminium,coated plates
- Energy-reduced arc with good gap bridging ability for welding and brazing
- Low spatter and stable for perfect weld quality
- Low heat input

Laser Hybrid Weld

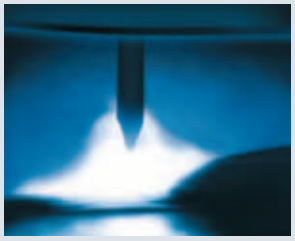
As efficient as never before



- High-capacity process for automated welding of steel, CrNi, aluminium, fine-graded steel
- High welding speed with a very deep penetration
- Low heat input and distortion
- Reduces weld preparation and rework

TIG Weld

Absolutely clean



- For steel, CrNi, aluminium,high-strength materials
- No spatter formation
- Safe root fusion
- Smooth weld surface - only a minimum of rework

Weld your way!

Providing added value for our customers! This objective drives our 700 motivated employees to achieve maximum performance. We are constantly raising our bar by pushing ourselves to provide innovative welding processes and solutions that will contribute to the long-term commercial success of your company!
Our process competence is at the forefront in welding and cutting of various ferrous and non-ferrous metals.
We offer our customers individual solutions which are optimised and adapted specifically to your product and production requirements. Leadership and competence equals process automation and welding at its best.

Whatever your needs are, we “Weld your way.”
CLOOS develops, manufactures and delivers innovative solutions in more than 40 countries worldwide.

With QINEO, the new generation of welding machines for manual and automated applications, and QIROX, the system for automated welding and cutting, our product range covers the entire spectrum of arc welding technology. Our product portfolio includes intelligent software, sensor and safety technology solutions – all of which are customised to meet your specific needs and requirements!
CLOOS provides full service solutions – all from a single source!

QINEO®

Arc welding at the highest level

- Power sources
- Wire drive units
- Welding torches
- Cable assemblies
- Accessories

QIROX®

Everything for automated welding and cutting.

- Robot mechanics
- Robot controllers
- Robot positioners
- Workpiece positioners
- Sensors
- Software

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Service

Service - The "Power Plus" for your production success:

- Efficiency check
- Simulation
- Test installation
- Training
- Hotline
- Spare parts management

Extracts from our reference projects

Weld with CLOOS ...

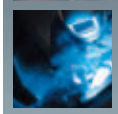

... all types of metal!


... all material thicknesses from 0.5 to 300 mm!

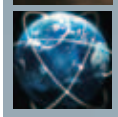

... using innovative welding processes!


... just as you need it, manually or automated!

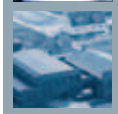

... efficiently and individually!


... and profit from many additional services!


... in all industries!


... all over the world!


... to your utter satisfaction!


... and benefit from almost 100 years of welding experience!

All over the world!

Carl Cloos Schweisstechnik GmbH
Industriestrasse 22-36
35708 Haiger
Germany

Telephone +49 (0)2773 85-0
Telefax +49 (0)2773 85-275
E-Mail info@cloos.de
www.cloos.de

Austria
CLOOS Austria GmbH,
A-2362 Biedermannsdorf
www.cloos.co.at

Belgium/Netherlands/Luxembourg
CLOOS Benelux N.V.
B-3300 Tienen
www.cloos.be

Brazil
CLOOS Técnica em Soldagem
Guarulhos / São Paulo
07240-180
www.cloos.com.br

China
CLOOS Welding Technology (Beijing) Ltd.
Beijing 101113
www.cloos.cn

Czech Republic
CLOOS Praha GmbH
CZ-25242 Jesenice
www.cloos.cz

Great Britain
CLOOS UK Ltd.
GB-Wolverhampton WV 10 6 HR
www.cloos.co.uk

India
CLOOS India Welding Technologies Pvt Ltd.
PUNE 411 014
www.cloos.in

Mexico
CLOOS Robotic de Mexico
Apodaca, N.L. Mexico
CP. 66600
www.cloos.com.mx

Russia
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RU-125445 Moskau
www.cloos.ru

Switzerland
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CH-2400 Le Locle
www.cloos.ch

Turkey
CLOOS Kaynak Teknik Sanayi Ltd. Sti.
41400 Gebze Kocaeli Türkiye
www.cloos.com.tr

USA
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