Industrial competence: Agriculture

Solutions for automated welding and cutting
in agricultural machinery manufacturing

CLOOS

Weld your way.

www.cloos.de

"Something said briefly can be the fruit of much long thought."

Friedrich Nietzsche

Content

We understand your business

The requirements for agricultural machinery changed fundamentally in recent years. The rapidly-growing world population with advancing urbanisation and changed nutritional habits require solutions which enable better usage of the limited agricultural space available.

Reliability, user-friendliness and high mobility are essential for modern tractors and other machinery used in the agricultural and forestry industries. Components must be made of materials which enable lightweight construction for maximum possible energy-savings. At the same time, they must withstand extreme conditions and loads.

With these increasing requirements for the production of agricultural machinery, the joining process is of particular significance. An effective and efficient assembly process without reworking can only be achieved by compensating for component tolerances and minimising distortion through low heat input in the welding process. Ensuring cost-optimised manufacture of the often large-volume components – even in batch size 1 – also requires networked CAD design and programming systems and autolearning robotic- and sensor technology.

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

Fully-automated to the tiniest detail

Project description

The complex production line for tractor cabs comprises both manual and automatic chained systems. The line is approx. 70 meters long and encapsulates the entire MAG welding process from small assemblies to the final cab in a range of variants. The system with QRC350-type QIROX robots is setup time-free and perfectly coordinated.

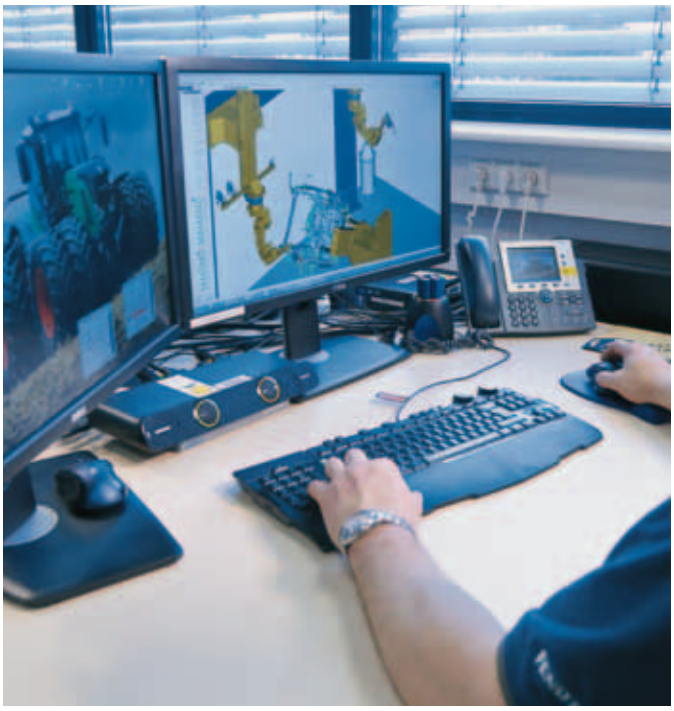
Three QRC-E 350- and QRC 350-type QIROX robots weld the different cab variants

Project description

The automatic handling technology ensures seamless component transport between the different manufacturing stages. The result: optimal logistics paths, short cycle times and minimum space requirements for allocation areas.

Robots, workpiece positioners and manual welding technology work hand-in-hand.

All systems are designed as multi-stational systems



Offline-programming is carried out with the RoboPlan software from CLOOS

The different cab variants can be welded without conversions or set-up changes

Highlights

- **Excellent efficiency** due to optimum product quality and perfectly matched components
- **Maximum productivity** due to multi-stational concept
- **Sensors and software** guarantee efficiency and quality
- **No downtimes** for programming and maintenance
- **High welding speeds and reliable root formation** thanks to innovative CLOOS welding technology

The Moduliner from Kuhn with Maxipacker roller

Project description

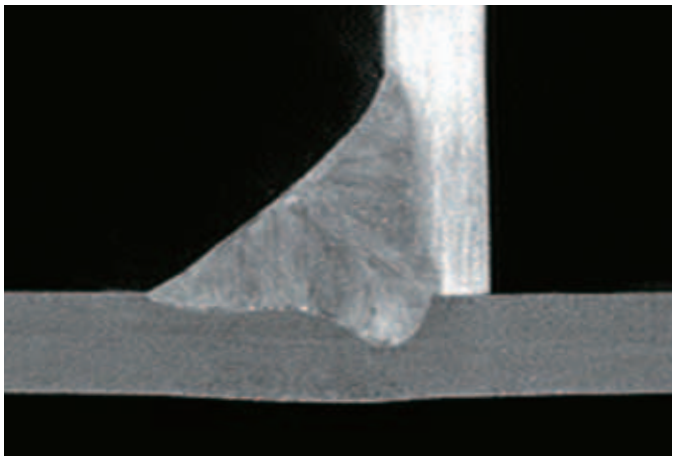
Fully-automated robot production lines for the welding of fork arms for packer rollers. The steel rollers are collected from a chain belt by a conveyor system and transferred to the welding station.

Two CLOOS robots (QRC 350), fitted with gripping system and welding torches, collect the fork arms to be welded from a defined location, place them on the roller and commence the joining or welding process automatically.

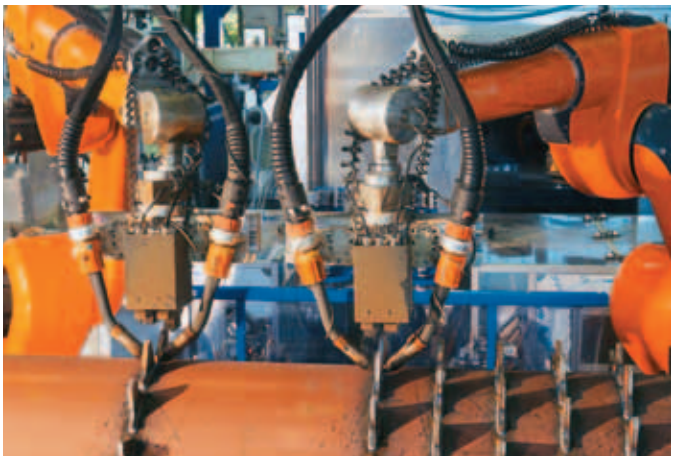
Uniquely, the fork arms are sorted fully automatically as bulk materials and transported in the correct position to the robot receiving point.

Welding is carried out rapidly and safely with 4 CLOOS QINEO Pulse 450A power sources.

The welding torches with gripping system locate the fork arms on the roller and carry out welding



Micro-section of weld in Speed Weld process



Two QRC 350-type robots automatically collect the fork arms as bulk material and locate them optimally on the component

Highlights

- **High processing time** due to automated component feed
- **Efficient production** by autonomous production line, almost operator-free
- **Great flexibility** due to intelligent PLC control, which enables simple and fast refit to other roller types
- **Constant quality** even in 3-shift operation

The Vario tractor from Fendt with the Cargo front-loader

Project description

Agrostroj produces high-quality front loaders which can be mounted to the most varied tractors and vehicles all over the world. The different components are subject to high quality and safety regulations because they have to be safe every day on the fields and meadows, in the wood or in the city and under the most different climatic conditions.

There is a special attention to the weld quality of the highly dynamic and stressed lifting arms. The working range of the six-axis robot is enlarged by a turnable C-frame. This and a rotating positioner with counter bearing ensure a perfect weld seam position and an excellent production quality. Furthermore the robot system is equipped with two stations so that the operator (loading and unloading of the workpieces) and the robot can work simultaneously.

The welds of the completed front loaders meet the highest tensile-strength standards with an equally pleasing weld surface.

Programming of the front-loader using CLOOS RoboPlan software

Positioning of the component in the optimum welding position

Highlights

- **Feasibility studies and simulation** with RoboPlan offline programming system
- **Outstanding weld quality** due to the use of laser sensors

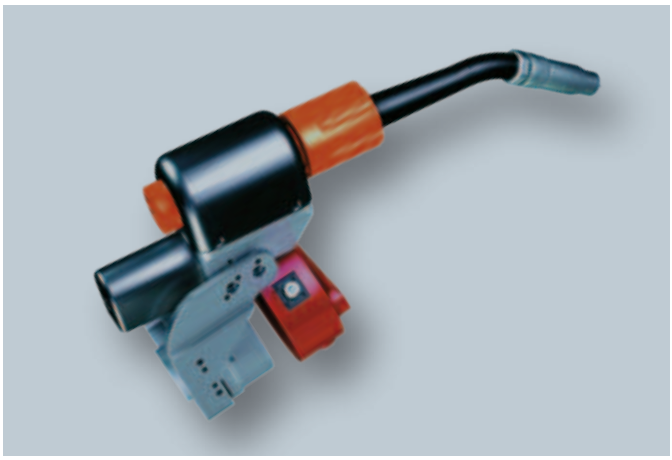
The Tucano 480 combine from Claas

Project description

The 7-axis welding robot is mounted to an overhead-mounted linear track. Thus the robot can change between the two production stations. Due to this layout the operator and the robot can work simultaneously and the system efficiency increases.

The turn/tilt positioner always positions the complex workpiece perfectly for welding. Contours where the positioner axes synchronously move with the robot axes are welded easily.

The overhead-mounted CLOOS 7-axis QRC-E 350 robot welds the combine frames with optimum accessibility



The QR-SN-LS offline laser sensor for optimum measurement of the weld before the welding process

Optimum accessibility of the component by exact positioning of component and robots

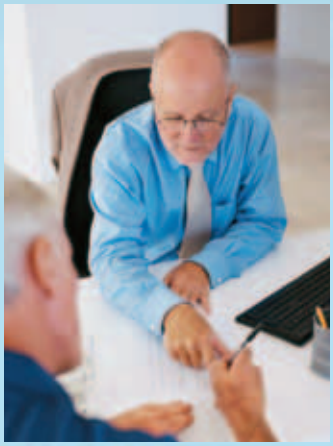
Highlights

- **Extension of the working area** by seventh robot axis
- **Optimum access to component** by gantry and positioner system
- **Outstanding weld quality** due to the use of laser sensors
- **Feasibility studies and simulation** with RoboPlan offline programming system

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 - all 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.

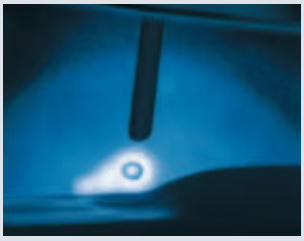
Control Weld

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

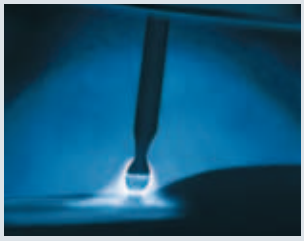
For aluminium welding and MIG brazing



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

Speed Weld

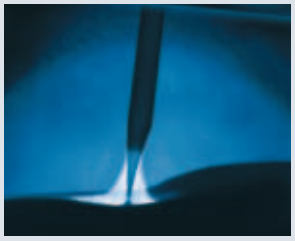
Special process for rapid welding



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

Rapid Weld

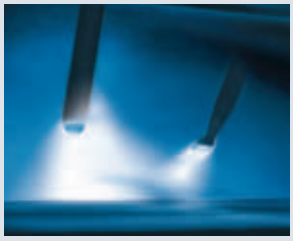
Deep penetration, high deposition rates



- 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

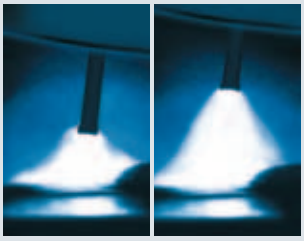
The process for more productivity



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

Cold Weld

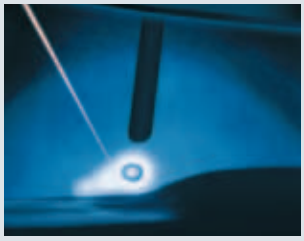
Welding with minimum heat input



- 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

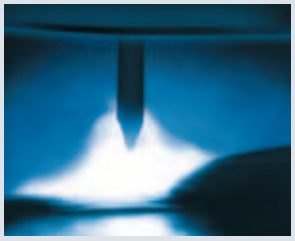
As efficient as never before



- 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
- Connection cable assemblies
- Accessories

QIROX®

Everything for automated welding and cutting.

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

Service Hotline
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Service

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

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

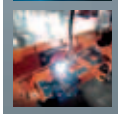
Extracts from our reference projects

Weld with CLOOS ...

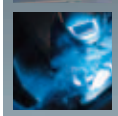

... all types of metal!

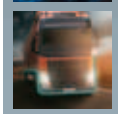

... all material thicknesses from 0.5 to 300 mm!

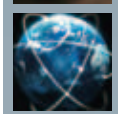

... using innovative welding processes!

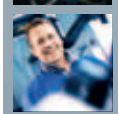

... manually or automated, just as you need it!

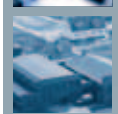

... efficiently and individually!


... 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!

Worldwide!

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QIROX29