

Laser MIG/MAG Hybrid Welding

Economic, safe, fast

CLOOS

Weld your way.

www.cloos.de

**"The best way to predict the future is
to invent it."**

Alan Kay





As efficient as never before

MIG/MAG Hybrid Laser Hybrid Welding process - this is the future

The Laser MIG/MAG hybrid welding process is not a new process, but there is a big demand for it because the technology is now more efficient than ever. Compared to traditional Tandem and MAG welding, considerable savings in production time and filler material are possible. Single pass weld seams can be welded without preparation even in the case of thick plates. Moreover a high weld speed can be reached when welding either thin plates or thick plates.

As a specialist of all kinds of welding processes, CLOOS has developed Laser MIG/MAG hybrid welding to be suitable for the market.

This technology has been perfected by continuously working in close co-operation with customers and research institutes since 2004. Components for construction machinery, railway and commercial vehicles as well as for the automotive industry are being produced today on CLOOS Laser MIG/MAG hybrid welding systems. The advantages can be seen in the synergic effects between the two welding processes.

The best of both technologies

The Laser MIG/MAG technology combines the advantages of two proven welding processes.

The laser beam melts the material at a small focal spot. Due to the high energy density, the laser beam deeply penetrates the material and evaporates it. The MIG/MAG process creates a wider focal spot and feeds filler material to the molten pool. The filler material fills the funnel formed by the laser beam and ensures a safe side wall fusion. This results in welds with deep penetration and high quality.

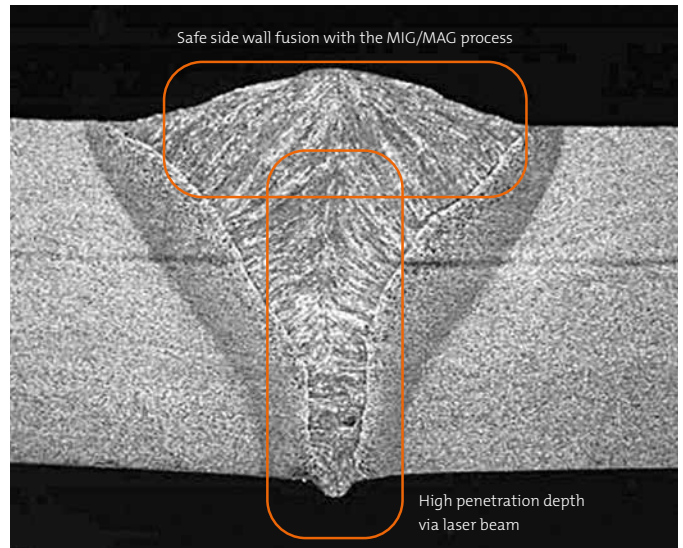
The parameters of the two processes can be set individually. Shape and depth of the penetration can therefore be adapted perfectly to the workpiece to achieve optimum weld seam quality.

Advantages in comparison to MIG/MAG welding

- More productivity due to higher weld speed
- Less seam preparations in the case of thicker plates and "one layer welding"
- Less workpiece distortion due to lower heat input
- Higher penetration depth
- Stable process due to the interaction of the processes

Advantages in comparison to laser beam welding

- Lower sensitivity to workpiece tolerances
- Improved weld seam stability due to improved side wall fusion



Shorter processing time*:

Up to 57%

Less filler material*:

Up to 70%

*Comparison of Tandem and Laser MIG/MAG hybrid
Low-alloyed steel, plate thickness 10 mm

Unique on the market: 7th axis

The Laser MIG/MAG hybrid head with integrated 7th axis developed by CLOOS is unique on the market. Due to this freely programmable axis the angles of attack of the laser beam and the MIG/MAG welding torch can be programmed to obtain a perfect synchronisation. Unnecessary robot movements are avoided, the process speed is increased and highest requirements regarding the weld quality are met.





Single source supply

The diligent pioneering work of CLOOS has enabled the laser MIG/MAG hybrid welding process to be brought to the market. And even more: As system supplier CLOOS also provides a highly efficient MIG/MAG power source, a unique welding head, a modern robot controller and all elements of the robot welding system. CLOOS can also supply the protective cabins which are individually adapted for the required tasks. A crucial competitive advantage for industries where high-quality weld seams are required.

With the laser MIG/MAG hybrid process nothing is left to chance: Seam tolerances and gap geometry are analysed before welding. Also all relevant process data is continuously evaluated during welding and recorded for further application: temperature,



plasma, back reflex, laser capacity as well as the MIG/MAG parameters. Thus, the user benefits from maximum efficiency at reliable quality.

The new CLOOS QINEO welding machine ensures optimum results when MIG/MAG welding. It can be used for all MIG/MAG welding processes and all materials. With the BUS control and self-learning weld data monitoring, laser MIG/MAG hybrid welding is simple to use. A reliable and powerful feed of the filler material is guaranteed by the QINEO wire drive system Wire Drive Automation.

Sensor technology ensures quality

The laser MIG/MAG hybrid process does not only combine the advantages of every single process, but gains additional synergy effects from the combination. The arc ensures a good gap bridging in the case of tolerances during workpiece preparation whereas the laser makes the high weld depth possible due to its high power density. Laser and arc plasma match perfectly regarding the process stability.



The laser MIG/MAG hybrid welding technology is not only of high interest for the thin plate application in the automotive industry, but also for thicker plate welding of components for commercial vehicles, railway carriages and construction machinery.







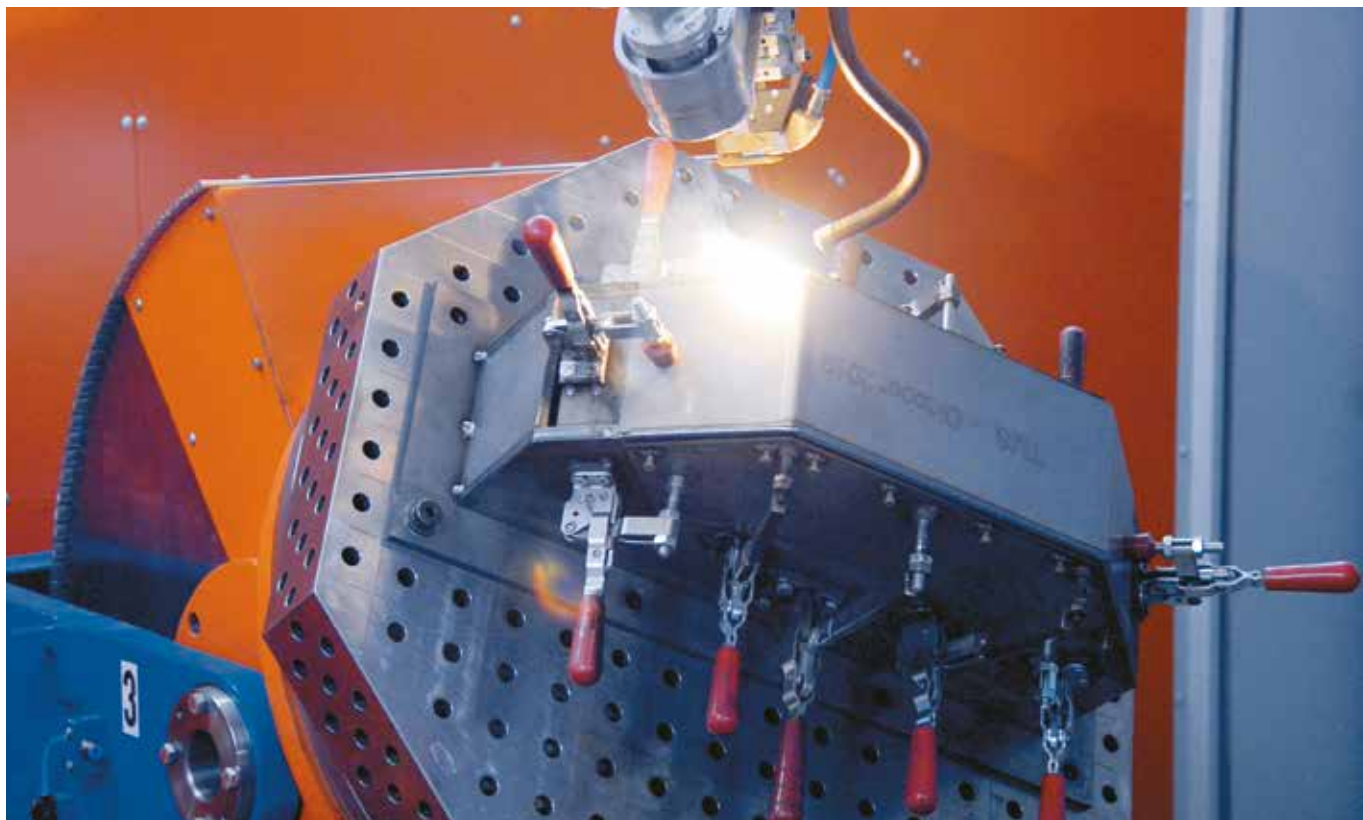
Project description

Alstom is well known as a global manufacturer in the energy and transportation industry. The company produces rail vehicles for long distance and urban traffic as well as for metro and underground systems. As part of this pilot project, which is relevant for the pan-European production, CLOOS upgraded an existing milling gantry with the most modern Laser MIG/MAG technology in order to manufacture the larger elements of the railway carriages more quickly and economically. After completion of the test phase further milling gantries in other locations are to be converted to laser hybrid systems.



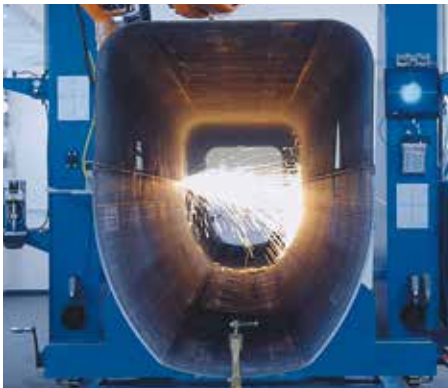
Project description

For the commercial vehicle sector CLOOS realised a turnkey laser MIG/MAG production line. Hydraulics jacks for tipper bodies and trailers are welded on the system. Thus the laser MIG/MAG technology achieved the breakthrough also when welding thicker plates.



Project description

The Luxemburg company TMS Metall- und Stahlbau wants to capture new markets and so is investing in a state-of-the-art laser welding system with robot technology from CLOOS. For the first time a Scan-Tracker optic is used for heat conduction welding so that different materials and weld geometries can be reliably processed.





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. To increase competitiveness, the company is currently investing in state-of-the-art production technology and optimised material flow in the traditional manufacturing shops. Its heart is a 60 m-long CLOOS laser welding/cutting system around which the production of the telescopic booms flows.



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



Service Hotline

+49 (0) 27 73/85-132

Service

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

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



All over the world!



Carl Cloos Schweisstechnik GmbH
Main office: Carl-Cloos-Strasse 1
Central warehouse: Carl-Cloos-Strasse 6
35708 Haiger
GERMANY

Tel.: +49 (0)2773 85-0
Fax: +49 (0)2773 85-275
E-Mail info@cloos.de

CLOOS

Weld your way.