Welding

Process diversity in perfection
<table>
<thead>
<tr>
<th>Process</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Weld</td>
<td>6</td>
</tr>
<tr>
<td>Speed Weld</td>
<td>8</td>
</tr>
<tr>
<td>Vari Weld</td>
<td>10</td>
</tr>
<tr>
<td>Rapid Weld</td>
<td>12</td>
</tr>
<tr>
<td>Cold Weld</td>
<td>14</td>
</tr>
<tr>
<td>Tandem Weld</td>
<td>16</td>
</tr>
<tr>
<td>Narrow Gap Weld</td>
<td>18</td>
</tr>
<tr>
<td>TIG Weld</td>
<td>20</td>
</tr>
<tr>
<td>Laser Hybrid Weld</td>
<td>22</td>
</tr>
<tr>
<td>From the idea to the component</td>
<td>24</td>
</tr>
<tr>
<td>The company</td>
<td>26</td>
</tr>
</tbody>
</table>
Weld your way.
The selection of the right welding process is essential for a successful production. With a large range of proven and innovative processes for manual and automated welding applications, we at CLOOS can offer solutions for the future providing excellent quality, maximum efficiency and productivity.

So, we continuously develop our welding processes in our technology centre under practical conditions.

Efficiency due to modern processes
Weld your way.

With the right combination of process, equipment, parameters and our know-how arising from a tradition of nearly 100 years in welding and cutting, we find for you the perfect solution for your production task. Thus we can give you a decisive lead among your competitors.

**Perfection due to diversity**

<table>
<thead>
<tr>
<th>Welding Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Weld</td>
<td>Reliable MIG/MAG welding process for thin and thick materials</td>
</tr>
<tr>
<td>Speed Weld</td>
<td>Stable MIG/MAG pulsed arc for numerous applications</td>
</tr>
<tr>
<td>Vari Weld</td>
<td>MIG/MAG pulsed arc for optimum welding results even under demanding conditions</td>
</tr>
<tr>
<td>Rapid Weld</td>
<td>High-capacity MIG/MAG spray arc for efficient welding</td>
</tr>
<tr>
<td>Cold Weld</td>
<td>Heat-reduced MIG/MAG AC pulsed arc for optimum results when welding sensitive materials</td>
</tr>
<tr>
<td>Tandem Weld</td>
<td>Combination of two synchronised MIG/MAG arcs for double capacity</td>
</tr>
<tr>
<td>Narrow Gap Weld</td>
<td>MIG/MAG process with narrow gap technology for efficient thick plate welding</td>
</tr>
<tr>
<td>TIG welding</td>
<td>Reliable process for clean and precise welding</td>
</tr>
<tr>
<td>Laser Hybrid Weld</td>
<td>Combination of laser welding and MIG/MAG arc for maximum efficiency and quality</td>
</tr>
</tbody>
</table>
Control Weld

Through thick and thin

Reliable MIG/MAG welding process for thin and thick materials

Control Weld covers the whole range of the controlled arc and is suitable for different applications. The classic MIG/MAG process offers a stable metal transfer from short arc to spray arc. At low power a short arc forms which is particularly advantageous when welding thin steel. When the power is increased the short arc turns to a spray arc. With regard to spray arc, this process has more energy and there is more heat input in the base material and the wire than with the short arc process. There are only few spatters due to the small, short-circuit proof metal transfer which reduces rework considerably. Benefit from the versatile application possibilities of Control Weld.

Do you search a reliable entry process for perfect welding quality? Then rely on Control Weld by CLOOS!

Applications

- Thin and thick plates
- Manual and automated welding
- Repair welding
- Welding under pure CO₂
- Welding with flux-cored wire
- MIG Brazing

Materials

- Steel
- High-strength steel
- Aluminium
- Chrome-nickel materials
- Coated plates

Your benefits

- Uniform arc
- Low heat input
- Good gap bridging ability
Application examples

Kuhn S.A.

Covering disks

Langmatz GmbH

Manhole cover

voestalpine AG

Axle casing
Pulsed arc process for rapid welding

Stable MIG/MAG pulsed arc for numerous applications

Speed Weld is used in all sectors of industrial production and is perfectly suitable for joining components with different plate thicknesses. The Speed Weld process is a U/I-controlled pulsed arc. Here the pulse phase is voltage-controlled and very resistant to external influences, such as stickout changes for example. The background current phase is current-controlled and ensures that the arc is maintained also with low currents. Due to the voltage regulation of the pulse phase the arc stabilises itself because of the internal control.

With Speed Weld you achieve high welding speeds because of the directionally stable and powerful arc. You benefit from the excellent weld quality due to the deep penetration. You avoid extensive reworks as the pulsed arc technology reduces spatters to a minimum.

Do you look for a stable all-round process which can be used either in the low- or in high-capacity range? Then rely on Speed Weld by CLOOS!

Your benefits

- High welding speed due to a stable arc
- Excellent weld quality due to deep penetration
- Reduced reworks thanks to the pulsed arc technology with regulated drop separation

Applications

- Thin to thick materials
- Versatile use, either in the lower or in the upper capacity range
- Particular strengths in the case of aluminium applications
- Welding with flux-cored wire
- MIG Brazing

Materials

- Steel
- High-strength steel
- Aluminium
- Chrome-nickel materials
- Coated plates
- Heat-resistant steel
Application examples

Terex Cranes Germany GmbH

Base frame

Stahl- und Metallbau IHNEN GmbH & Co. KG

Spinner supports

STAHA-Systemhallen GmbH

Hall girders
Vari Weld

For aluminium welding and MIG brazing

MIG/MAG pulsed arc for optimum welding results even under demanding conditions

Vari Weld is particularly suitable for aluminium applications, cladding or welds with special requirements regarding the appearance of the weld surface. The Vari Weld process creates an extremely low spatter pulsed arc. The arc control of this pulsed arc process ensures a constant amperage when the distance of the welding torch to the material changes. The capacity remains the same. Thus the weld pool is perfectly controllable within the whole capacity range.

The material characteristics remain nearly unchanged, particularly in the case of heat-sensitive materials. You avoid extensive reworks thanks to the reduced component distortion. So you achieve optimum welding results even under demanding conditions.

Do you wish a reliable welding process for excellent quality? Then rely on Vari Weld by CLOOS!

Applications
- MIG brazing of surface-coated or high-strength thin steel plates
- Sensitive materials
- Welding of flux-cored wires
- Cladding

Materials
- Steel
- High-strength steel
- Aluminium
- Chrome-nickel materials
- Coated plates
- Heat-resistant steel

Your benefits
- Optimum weld pool control by a stable arc
- Conservation of the material characteristics due to minimised heat input
- Reduced reworks because of reduced component distortion
Application examples

LTI-Metalltechnik GmbH

Fan wheel

AGCO GmbH

Tractor cabin

Wessel GmbH Kessel- und Apparatebau

Heat exchanger pipe
Rapid Weld

That's what efficiency looks like!

High-capacity MIG/MAG spray arc for efficient welding

Rapid Weld provides advantages wherever high penetration depths and a safe root fusion are required. The process is particularly suited for manual and automated applications in industries such as construction machinery, shipbuilding and railway vehicle construction. Rapid Weld is a high-capacity spray arc. The special control generates a very focused stable arc with a very high arc pressure. With the help of special electrical parameters, both a wide arc and a narrow, focused arc can be set. Thus you can exactly model the penetration profile. Due to the very small opening angle you reduce filler material and shielded gas. You obtain complete fusions due to the deep penetration. You reduce the welding time as considerably less welding layers are necessary.

Do you wish to bring down your production costs with a powerful process and to increase your welding productivity? Then rely on Rapid Weld by CLOOS!

Your benefits

- Reduction of filler material and shielded gas due to a smaller opening angle
- Complete fusions thanks to deep penetration
- Minimised welding times because of a reduced number of welding layers

Applications

- Thick steel materials
- Automated and manual welding
- Root passes in the case of thick plates
- Welding with a large stick out

Materials

- Steel
Application examples

Viessmann Group

Heating boiler

Terex Cranes Germany GmbH

Base frame

GOLDBECK GmbH

Supports
Welding with minimum heat input!

Heat-reduced MIG/MAG AC pulsed arc for optimum results when welding sensitive materials

Due to the minimum heat input, Cold Weld is perfectly suitable for thin plates and heat sensitive materials such as aluminium or high-strength steel. Cold Weld combines a pulsed arc with AC technology. By means of the polarity ratio the heat input in the component can be controlled very precisely. Thus the heat input can be controlled perfectly.

With Cold Weld you reduce your welding times due to the high deposition rate. You keep the original material properties because of the minimised heat input. You reduce the component distortion and avoid extensive reworks. You compensate material tolerances due to the good gap bridging ability.

Do you wish to reduce your production costs for thin plates and to increase the quality at the same time? Then rely on Cold Weld by CLOOS!

Applications
- Thin plates
- Welding of distortion-prone workpieces
- Very good automation capability
- Welding of workpieces with air gap

Materials
- Steel
- High-strength steel
- Aluminium
- Chrome-nickel materials
- Coated plates

Your benefits
- Reduced welding times because of high deposition rate
- Conservation of the material characteristics due to reduced heat input
- Avoidance of reworks thanks to minimised component distortion
Application examples

AKP Otomotiv

Fuel tank

Matyssek Metalltechnik GmbH

Hood
Tandem Weld

Powerful welding times two

Combination of two synchronised MIG/MAG arcs for double capacity

Tandem Weld can be universally applied either for thin or for thick plate welding. In the Tandem Weld process, two arcs burn in a common molten pool. The process is based on two electrically separated processes which match each other perfectly. This possibility opens up a multitude of combinations. The front wire ensures a safe penetration, the back wire quickly fills big joints with filler material. The high deposition rate can result in weld speed or in volume filling. Therefore, Tandem weld is suitable for thin and for thick plates.

With Tandem Weld you reduce your welding times due to the high deposition rate. You reduce the component distortion and avoid extensive reworks thanks to the low heat input. You compensate material tolerances due to the good gap bridging ability. You benefit from the wide range of applications as Tandem Weld can be used for many materials and thicknesses.

Do you wish to maximise the efficiency of your weld production? Then rely on Tandem Weld by CLOOS!

Your benefits

Maximum weld speed because of high deposition rate
Reduced component distortion thanks to low heat input
Compensation of material tolerances due to good gap bridging ability

Applications

Universally applicable
Thin to thick materials
Automated welding
Welding with a high duty cycle
Applications requiring high deposition rates

Materials

Steel
High-strength steel
Aluminium
Chrome-nickel materials
Coated plates
Application examples

Albert-Frankenthal GmbH

SCHOTTEL GmbH

F.X. Meiller GmbH & Co. KG
Narrow Gap Weld

Revolution for thick plate welding

MIG/MAG process with narrow gap technology for efficient thick plate welding

Narrow Gap Weld is suitable for plates with a material thickness of more than 35 mm. The narrow gap blade is the heart of narrow gap welding. The oscillating wire guarantees optimum side wall joints. The narrow gap blade is able to enter into gaps which are up to 300 mm deep, but only 20 mm wide. It guides wire, shielding gas and coolant.

With the narrow gap technology you just start saving during the prefabrication as there is no need of a weld seam preparation. You reduce the machine running time and the need of welding wire. You need less shielding gas. And you save energy.

Do you wish to reduce your production costs for thick plates and to increase the quality at the same time? Then rely on Narrow Gap Weld by CLOOS!

Applications

- Plate thicknesses of more than 35 mm
- Equipment manufacturing
- Tank construction for raised manholes
- Systems for power generation

Materials

- Steel
- High-strength steel
- Heat-resistant steel

Your benefits

- Less material consumption because of reduced weld volume
- Shorter production times due to reduced number of welding layers
- Avoidance of reworks thanks to minimised heat input
Application examples

<table>
<thead>
<tr>
<th>Siemens AG</th>
<th>BORSIG Process Heat Exchanger GmbH</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Turbine housings" /></td>
<td><img src="image2" alt="Custom heat exchangers" /></td>
</tr>
</tbody>
</table>

Turbine housings

Custom heat exchangers
Clean, precise and reliable

Reliable process for clean and precise welding

With the CLOOS products for TIG welding you are always a pinpoint ahead. Thin plates or pipe constructions: CLOOS has the right products for all materials and the most different components. The TIG welding process is very good for automation purposes and application at the robot. But we also offer small and compact inverter technology for workshop and trade.

You can individually adapt the deposition rate to the welding task as the welding power is not coupled to the wire feed. Avoid extensive reworks due to high-quality, spatter-free welds.

Do you wish a reliable welding process for excellent quality? Then rely on the TIG welding process by CLOOS!

Your benefits

- Individual adaptation of the deposition rate by uncoupling the welding capacity from the wire feed
- Avoidance of extensive reworks due to high-quality, spatter-free welds
- Excellent weld quality because of reliable process

Applications

- Thin to thick materials
- Root welding
- Visual welds
- Pipeline construction
- Equipment and reactor construction

Materials

- Steel
- Aluminium
- Chrome-nickel materials
Application examples

Hilge GmbH & Co. KG

SPARTHERM Feuerungstechnik GmbH

häwa GmbH
Laser Hybrid Weld is perfectly suitable for long, straight weld seams. Laser Hybrid Weld combines a laser beam with a MIG/MAG welding process in one common process zone. You benefit from the advantages of both welding processes. A restricted light beam with focus on the weld is created which is characterised by a very high energy density. This energy evaporates the material and penetrates it deeply. The MAG arc fed to the laser fills the crater and ensures a perfect side wall fusion. The main advantages of Laser Hybrid Weld are a deep penetration, low heat input and perfect side wall joints.

With Laser Hybrid Weld you increase your productivity due to highest welding speeds. You need less filler material because of the reduced number of welding layers. You reduce the component distortion and avoid extensive reworks thanks to the low heat input. You accelerate your whole production process by means of the reduced weld preparation.

Do you wish to combine maximum productivity and minimum costs? Then rely on Laser Hybrid Weld by CLOOS!

As efficient as never before

**Combination of laser welding and MIG/MAG arc for maximum efficiency and quality**

**Applications**
- Long straight welds
- Thin plates and thicker materials
- Heat-sensitive workpieces
- Complete fusions up to 15 mm plate thickness

**Materials**
- Steel
- High-strength steel
- Aluminium
- Chrome-nickel materials
- Coated plates

**Your benefits**
- Increased productivity due to maximum welding speed
- Less filler material because of a reduced number of welding layers
- Less component distortion due to low heat input
Application examples

TMS Metall- und Stahlbau S.A.

Housing

Manitowoc Deutschland GmbH

Telescope boom

Palfinger AG

Telescope boom

Weld your way.
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!
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 advises you on any extensions, modifications and retrofits of your existing robot and welding systems. We offer complete service packages for inspection, calibration and maintenance.
Providing added value for our customers! – This is the motivational force behind our 700 employees. We are constantly raising the 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!