

An abstract graphic consisting of two overlapping circles. The larger circle is a light blue with a dark blue border, and the smaller circle is a solid dark blue. They are set against a background that transitions from light blue on the left to dark blue on the right.

# Welding













Process diversity in perfection

**CLOOS**

Weld your way.

[www.cloos.de](http://www.cloos.de)

# Content

	<b>Control Weld</b>	Page 6
	<b>Root Weld</b>	Page 8
	<b>Rapid Weld</b>	Page 10
	<b>Speed Weld</b>	Page 12
	<b>Vari Weld</b>	Page 14
	<b>Cold Weld</b>	Page 16
	<b>MoTion Control Weld</b>	Page 18
	<b>MoTion Vari Weld</b>	Page 20
	<b>Tandem Weld</b>	Page 22
	<b>Laser Hybrid Weld</b>	Page 24
	<b>Narrow Gap Weld</b>	Page 26
	<b>TIG Weld</b>	Page 28



... in all  
industries!



# Perfection due to diversity

## Efficiency due to modern processes

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. With the right combination of process, equipment, parameters and our know-how arising from a tradition of 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.



### Control Weld

MIG/MAG welding process for thin and thick materials



### Root Weld

Energy-reduced MIG/MAG short arc for excellent quality under demanding conditions



### Rapid Weld

Focused high-capacity MIG/MAG spray arc for deep penetration and efficient welding



### Speed Weld

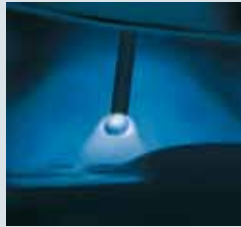
Voltage-controlled MIG/MAG pulsed arc for numerous applications





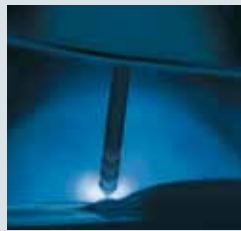
### **Vari Weld**

Current-controlled MIG/MAG pulsed arc for optimum welding results under demanding conditions



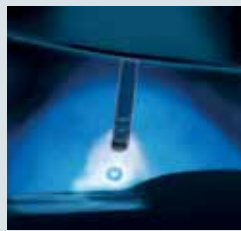
### **Cold Weld**

Directionally stable MIG/MAG AC pulsed arc for optimum results when welding demanding materials



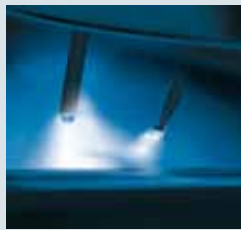
### **MoTion Control Weld**

Short arc with reversing wire drive unit



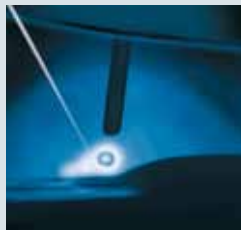
### **MoTion Vari Weld**

Pulsed arc with reversible welding wire



### **Tandem Weld**

Combination of two MIG/MAG arcs for maximum deposition rate



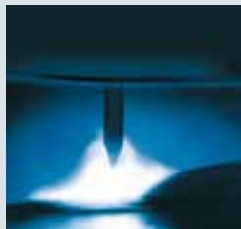
### **Laser Hybrid Weld**

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



### **Narrow Gap Weld**

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



### **TIG Weld**

TIG process for clean and precise welding



## Through thick and thin

### MIG/MAG welding process for thin and thick materials

Control Weld covers the whole range of controlled MIG/MAG welding 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 joining thin components and out-of-position welds. With regard to spray arc, this process has more energy and there is more heat input in the base material. There are only few spatters due to the small, short-circuit proof metal transfer which also results in less rework.

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

#### Applications

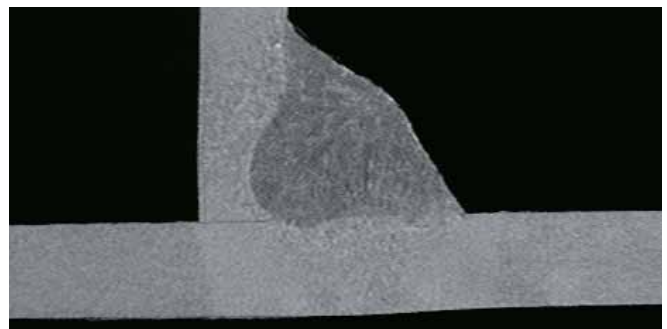
- Universally applicable
- Thin and thick plates
- Welding with flux-cored wire
- Suitable for all welding positions
- Welding under pure CO<sub>2</sub>

#### Materials

- Steel (unalloyed, low-alloyed, high-alloyed)
- Chrome-nickel
- Aluminium

## Your benefits

- Versatile process
- Good gap bridging ability in the short arc range
- Low spatters in the spray arc range





## Application examples

Kuhn S.A.



Covering disks



Langmatz GmbH



Manhole cover



voestalpine AG



Axle casing



# Root Weld



## Stable and insensitive

### Energy-reduced MIG/MAG short arc for excellent quality under demanding conditions

Root Weld is an energy-reduced, controlled MIG/MAG short arc which is suited for the special requirements of root welding or thin plate welding where out-of-position welds and varying gap widths often arise. Compared to the standard short arc, Root Weld is considerably quieter and produces less spatters. Due to the improved process control, Root Weld is more stable and can thus be perfectly controlled even in the lower capacity range. With Root Weld you reduce the workpiece distortion because of the lower heat input. You avoid extensive reworks due to the minimised spatter formation. You always achieve optimum welding results as the arc is resistant to external influences. Do you wish a stable welding process for excellent welding quality under demanding conditions?

### Applications

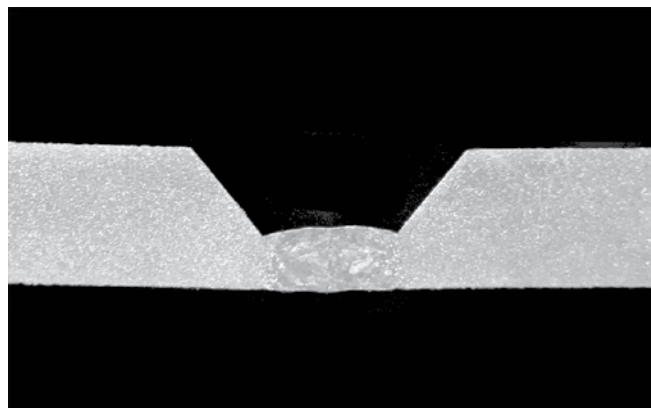
- Root welding
- Pipeline construction
- Container construction
- All welding positions

### Materials

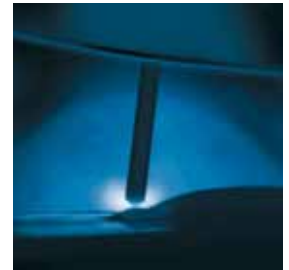
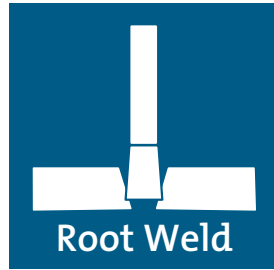
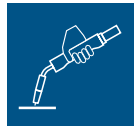
- Steel
- Chrome-nickel

## Your benefits

- Insensitive short arc
- Resistant to external influences
- Optimum gap bridging ability even without extensive oscillation
- Well controllable arc







## Application examples

### Pipeline construction



# Rapid Weld



## That's what efficiency looks like!

### Focused high-capacity MIG/MAG spray arc for deep penetration and efficient welding

Rapid Weld is a focused high-capacity MIG/MAG spray arc and provides advantages wherever high penetration depths and a safe root fusion are required. The special control generates a very focused stable arc with a very high arc pressure. The one-knob-operation allows you to specifically model the penetration profile from small to wide. 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!

#### Applications

- Thick components from 6 mm
- Small opening angles
- Deep penetration

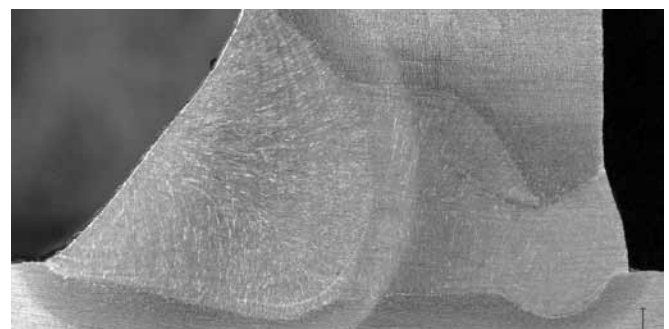
#### Materials

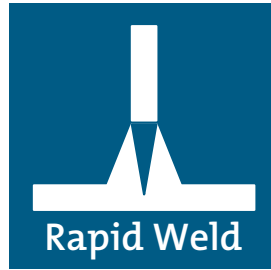
- Steel
- Chrome-nickel

Also available as pulse process!

## 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





## Application examples

### Viessmann Group



Heating boiler



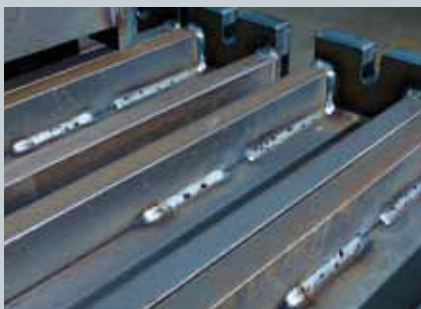
### Terex Cranes Germany GmbH



Base frame



### GOLDBECK GmbH



Supports



# Speed Weld



## Pulsed arc for rapid welding

### Voltage-controlled MIG/MAG pulsed arc for numerous applications

Speed Weld is used in all sectors of metal machining. The voltage-controlled MIG/MAG pulsed arc process allows a very high arc pressure even under demanding conditions. With Speed Weld you achieve high welding speeds because of the highly powerful arc. You benefit from the excellent weld quality due to the deep penetration. You avoid extensive reworks as spatters and undercuts are reduced 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!

### Applications

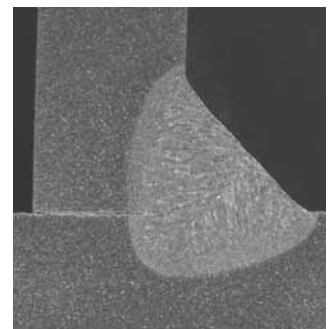
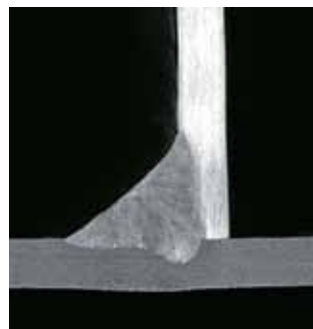
- Plate thicknesses from 2.5 mm
- Versatile use: High and low capacity range
- Complex aluminium components
- Welding with flux-cored wire
- MIG brazing

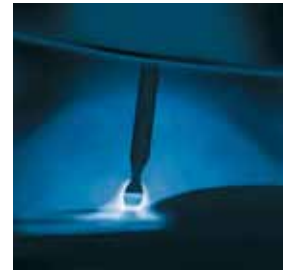
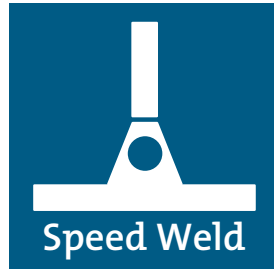
### Materials

- Steel
- Aluminium
- Chrome-nickel

## Your benefits

- High welding speeds due to the highly powerful arc
- Excellent welding quality because of a deep penetration
- Reduced rework thanks to the pulsed arc technology with regulated drop separation





## Application examples

### Terex Cranes Germany GmbH



Base frame



### Stahl- und Metallbau IHNEN GmbH & Co. KG



Spinner supports

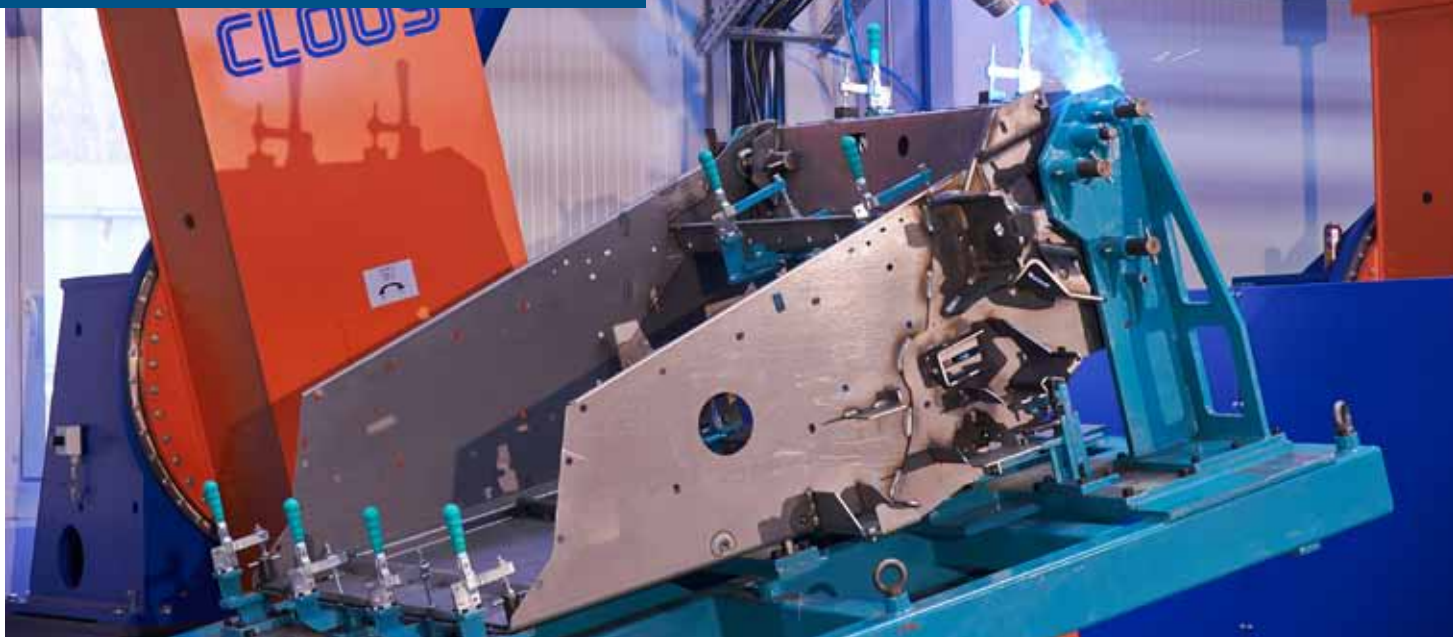


### STAHA-Systemhallen GmbH



Hall girders





## From easy to demanding

**Current-controlled MIG/MAG pulsed arc for optimum welding results under demanding conditions**

Vari Weld is a MIG/MAG pulsed arc for a very wide range of applications. The current-controlled MIG/MAG pulsed arc process allows controlling the penetration profile at a multitude of materials and applications. The material characteristics remain nearly unchanged, particularly in the case of heat-sensitive materials. You avoid extensive reworks as spatters are reduced to a minimum. 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

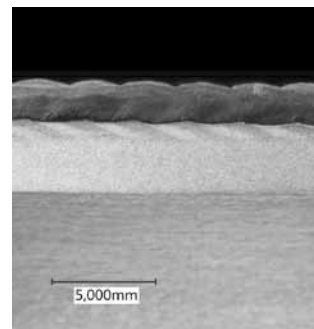
- MIG brazing
- Cladding
- Surfacing
- Plate thicknesses from 1.5 mm

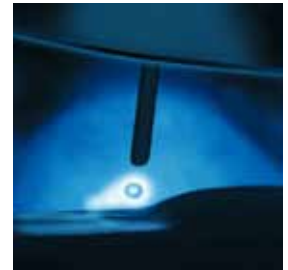
### Materials

- Chrome-nickel
- Aluminium
- Steel
- Coated plates
- Heat-resistant steel
- High-alloyed steel

## Your benefits

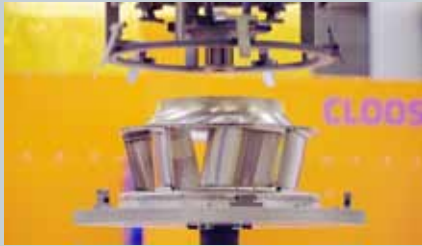
- Optimum weld pool control due to efficient arc control
- Excellent welding results at demanding applications (e. g. chrome-nickel)
- Reduced rework thanks to the pulsed arc technology with regulated drop separation





## Application examples

### LTI-Metalltechnik GmbH



Fan wheel



### AGCO GmbH



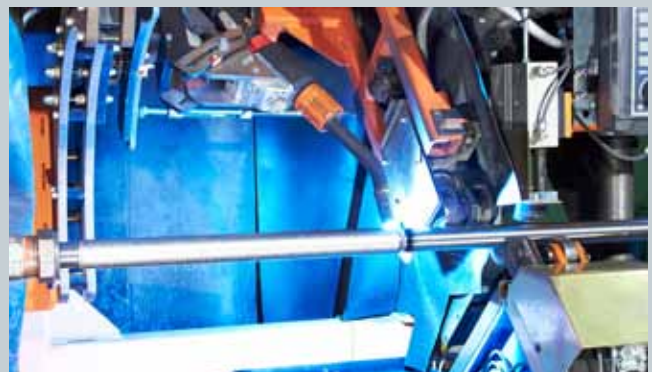
Tractor cabin



### Wessel GmbH Kessel- und Apparatebau



Heat exchanger pipe





## Welding with optimum heat input!

**Directionally stable MIG/MAG AC pulsed arc for optimum results when welding demanding materials**

Due to the optimum heat input, Cold Weld is perfectly suitable for demanding materials. Cold Weld combines a pulsed arc with AC technology. Due to the adjustable AC part you can individually control the heat input into the component. With Cold Weld you can get higher welding speed as you increase the deposition rate at a lower heat input. The optimum heat input has a positive effect on the component and material characteristics. 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 demanding materials and to increase the quality at the same time? Then rely on Cold Weld by CLOOS!

### Applications

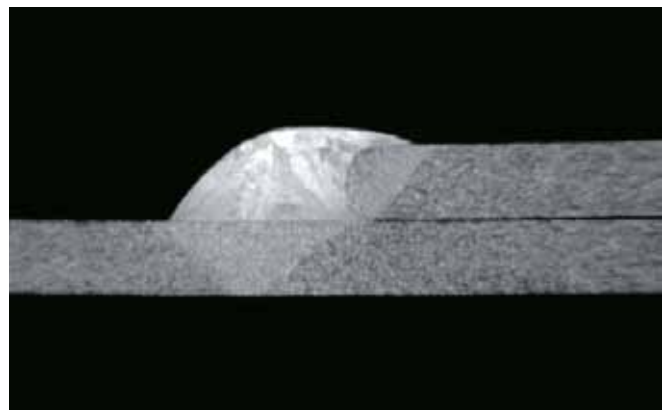
- Complex aluminium and chrome-nickel components up to  $t = 4 \text{ mm}$
- Root welding at magnetised steel components
- Aluminium extrusion / Casting alloy
- Hot-crack sensitive materials

### Materials

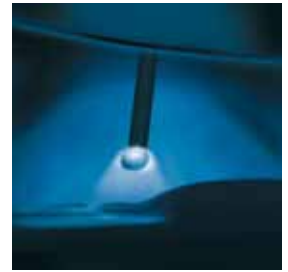
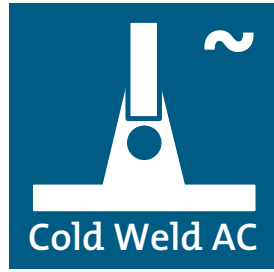
- Aluminium
- Chrome-nickel
- Steel
- Press-hardened steel materials

## Your benefits

- Excellent welding results due to a directionally stable MIG/MAG AC pulsed arc
- Shorter welding times because of high deposition rate
- Optimum material characteristics due to controllable heat input
- Avoidance of reworks thanks to minimised component distortion







## Application examples

### AKP Otomotiv



Fuel tank



### Matyssek Metalltechnik GmbH



Hood



# MoTion Control Weld



## For fine plates and additive production

### Short arc with reversing wire drive unit

MoTion Control Weld is particularly suitable for fine plate applications and applications in the lowest capacity ranges. The welding process provides advantages everywhere where special demands to weld surface and appearance are made. MoTion Control Weld is a combination of the proven CLOOS Control Weld process and reversing wire. In the process, the wire is drawn back and forward at a frequency of up to 180 Hz which results in an extremely high process stability to the lowest capacity range. You avoid extensive reworks due to the minimised formation of spatters and powder residues. Due to these characteristics MoTion Weld is particularly suitable for applications in the additive production.

Do you look for a stable process for excellent welds in fine-plate application or for additive applications? Then rely on MoTion Control Weld by CLOOS!

### Applications

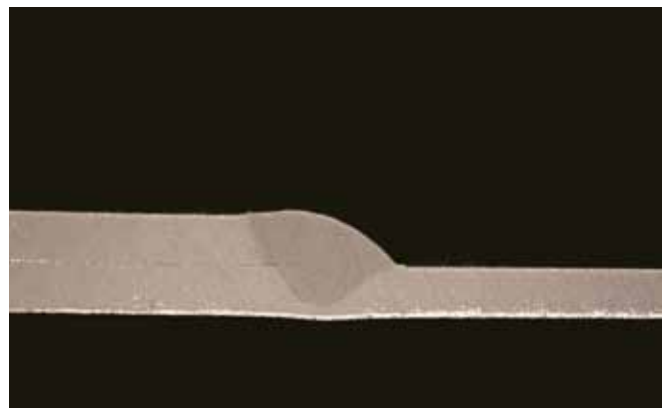
- Corner and flange welds
- MIG brazing
- Surfacing
- Thin plates up to 3 mm thickness
- Additive production
- All welding positions

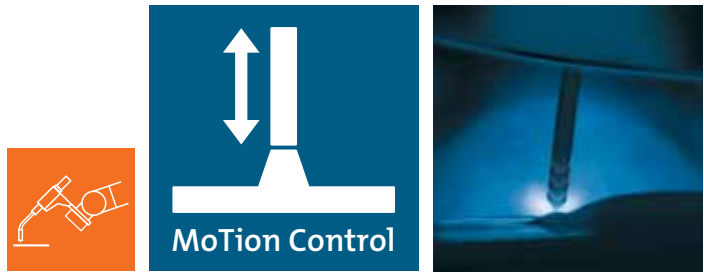
### Materials

- Steel
- Chrome-nickel
- Coated plates

## Your benefits

- Maximum process stability due to reversing wire
- Reduced rework because of minimised formation of spatters and power residues
- Excellent weld quality due to precise heat control
- Efficient welding production because of an up to 40 % higher welding speed





## Application examples

Henke GmbH



Light box cover

# MoTion Vari Weld



## Excellent welding quality at fine plates

### Pulsed arc arc with reversing wire drive unit

MoTion Vari Weld is particularly suitable for fine plate applications and applications in the lowest capacity ranges. The welding process provides advantages everywhere where special demands to weld surface and appearance are made. MoTion Vari Weld is a combination of the proven CLOOS Vari Weld process and reversing wire. In the process, the wire is drawn back and forward at a frequency of up to 180 Hz which results in an extremely high process stability to the lowest capacity range. You avoid extensive reworks due to the minimised formation of spatters and powder residues. Due to these characteristics MoTion Weld is particularly suitable for applications in the additive production.

Do you look for a stable process for excellent welds in fine-plate application, aluminium applications or for additive production? Then rely on MoTion Vari Weld by CLOOS!

### Applications

- Thin plates up to 3 mm thickness
- MIG brazing
- Cladding
- Additive production
- All welding positions

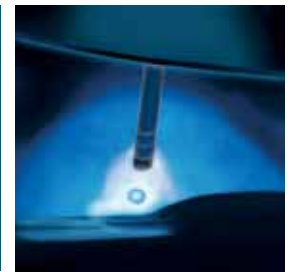
### Materials

- Aluminium
- Chrome-nickel
- Coated plates

## Your benefits

- Maximum process stability due to reversing wire
- Reduced rework because of minimised formation of spatters and powder residues
- Excellent weld quality due to precise heat control





## Application examples

Henke GmbH



Roof rack



Henke GmbH



Electrical switch cabinet



# Tandem Weld



## Powerful welding times two

### Combination of two MIG/MAG arcs for maximum deposition rate

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 both weld speed and 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!

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### Applications

- Wide range of application
- Universally applicable
- Applications requiring high deposition rates
- Shipbuilding, steel construction, railway vehicles

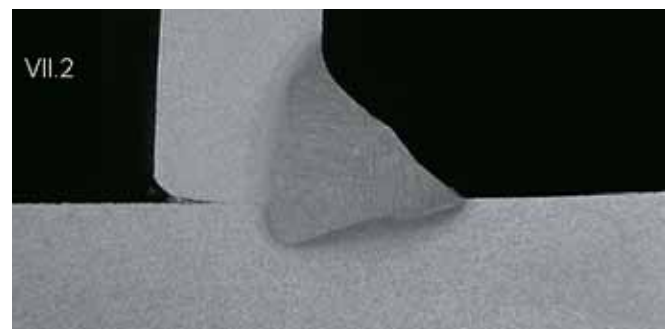
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### Materials

- Steel
- Aluminium
- Chrome-nickel

## Your benefits

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





## Application examples

### Albert-Frankenthal GmbH



Print rollers



### SCHOTTEL GmbH



Structural support tube



### F.X. Meiller GmbH & Co. KG



Dumpers



# Laser Hybrid Weld



## As efficient as never before

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

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. The laser beam penetrates the material deeply and forms a keyhole. The MIG/MAG arc following the laser stabilises the process, supports a perfect joining of the edges and improves the gap bridging ability. 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!

### Applications

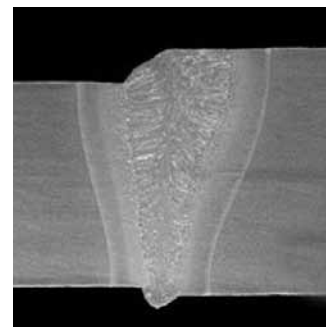
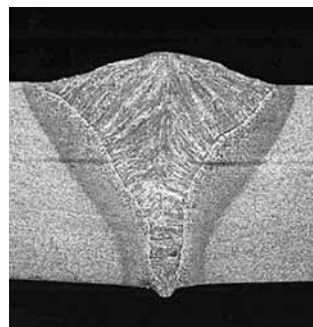
- Long straight welds
- Thin and thick plates
- Heat-sensitive workpieces
- Complete fusions up to 15 mm plate thickness

### Materials

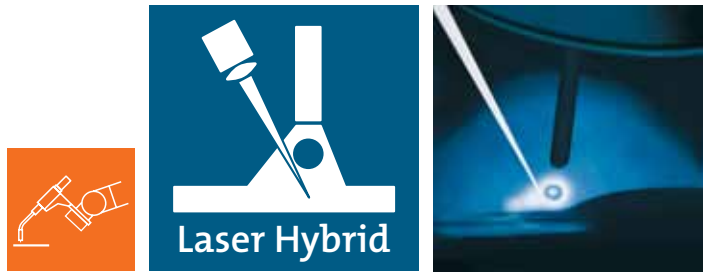
- Steel
- High-strength steel
- Aluminium
- Chrome-nickel
- Coated plates

## Your benefits

- Increase productivity due to maximum welding speed
- Less filler material because of reduced number of welding layers
- Lower component distortion due to lower heat input







## Application examples

TMS Metall- und Stahlbau S.A.



Housing



Manitowoc Deutschland GmbH



Telescope boom



Palfinger AG



Telescope boom



# 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

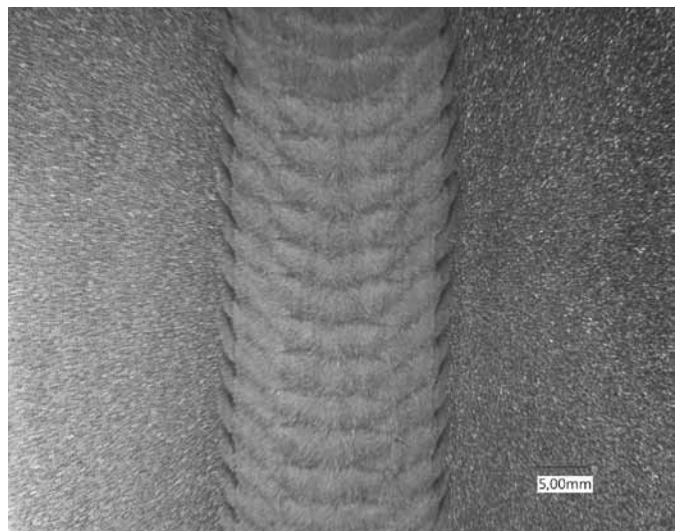
- Plate thicknesses from 35 mm
- Equipment manufacturing
- Systems for power generation
- Tank construction

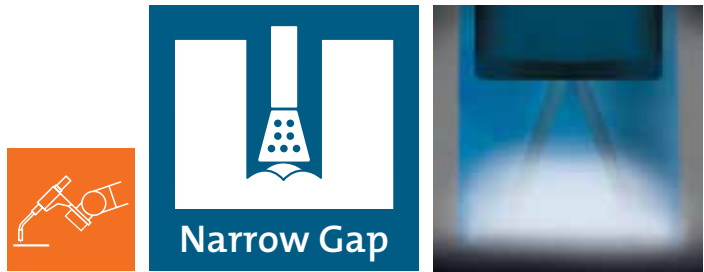
### Materials

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

## Your benefits

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





## Application examples

### Siemens AG



Turbine housings



### BORSIG Process Heat Exchanger GmbH



Custom heat exchangers



# TIG Weld



## Clean, precise and reliable

### TIG process for clean and precise welding

TIG Weld is particularly suitable for demanding welding connections and is used in industry as well as in workshop and trade. Furthermore, the flexible process is the perfect choice for repair welding. During TIG Weld, the arc burns between the non-melting tungsten electrode and the workpiece. You can use either direct or alternate current in different variants. And you can use TIG Weld with or without filler material.

This separation of the important parameters option allows the decoupling of the welding capacity from the filler metal supply. Thus, you can perfectly adapt the welding parameters to your individual welding task. A considerable increase of the welding speed is possible by using further process variants as for example high-frequency pulse.

Avoid extensive reworks due to high-quality, spatter-free welds. Do you wish a reliable welding process for excellent quality? Then rely on TIG Weld by CLOOS!

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### Applications

- Root welding
- Visual welds
- Pipeline construction
- Equipment and reactor construction

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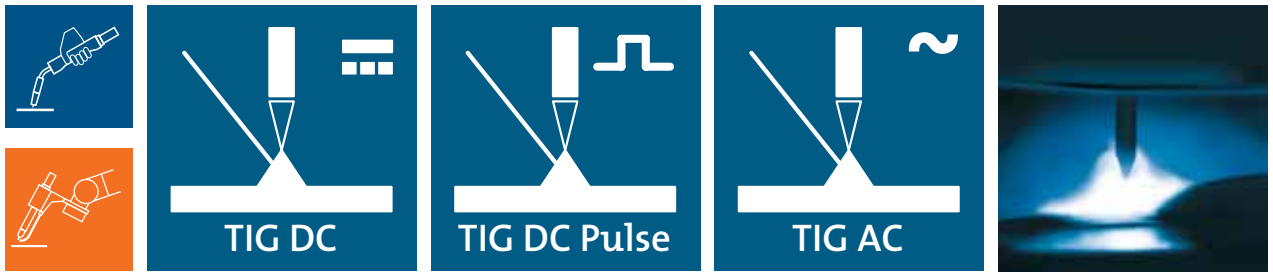
### Materials

- Chrome-nickel
- Aluminium
- Steel

## Your benefits

- Excellent welding quality due to the reliable process
- Individual adaptation of the deposition rate by decoupling welding capacity and wire feed
- Avoidance of rework due to high-quality, spatter-free weld seams





## Application examples

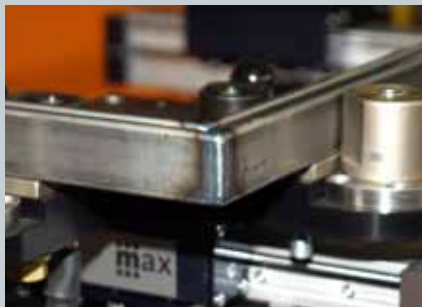
Hilge GmbH & Co. KG



Pump housing



SPARTHERM Feuerungstechnik GmbH



Door frame



häwa GmbH



Housings



# The way ...



## Consulting

With this comprehensive “pre-service”, we take care of your project from the beginning and transfer our integrated process expertise to your component..



## Planning

We elaborate a solution which perfectly meets your individual requirements.



## Design

Due to the modular design of our product series we develop customised solutions which meet all your production requirements.



## Production

Welding machine and robot technology is our strength - including our core competence: the arc.



## Commissioning

Our specialists carry out the installation step-by-step in your production hall and test your system for faultless functionality.



## Training

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



## Service

Our competence team advises you on any extensions, modifications and retrofits of your existing robot and welding systems.

... to your success.

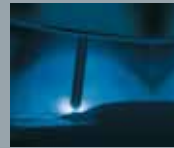
# With CLOOS you weld and cut ...



... all types of metal!



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



... with innovative 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!



... for 100 years!

## ...all from a single source!

# All over the world



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**CLOOS**

Weld your way.

Subject to technical alterations.

PR2012-Prozessuebersicht