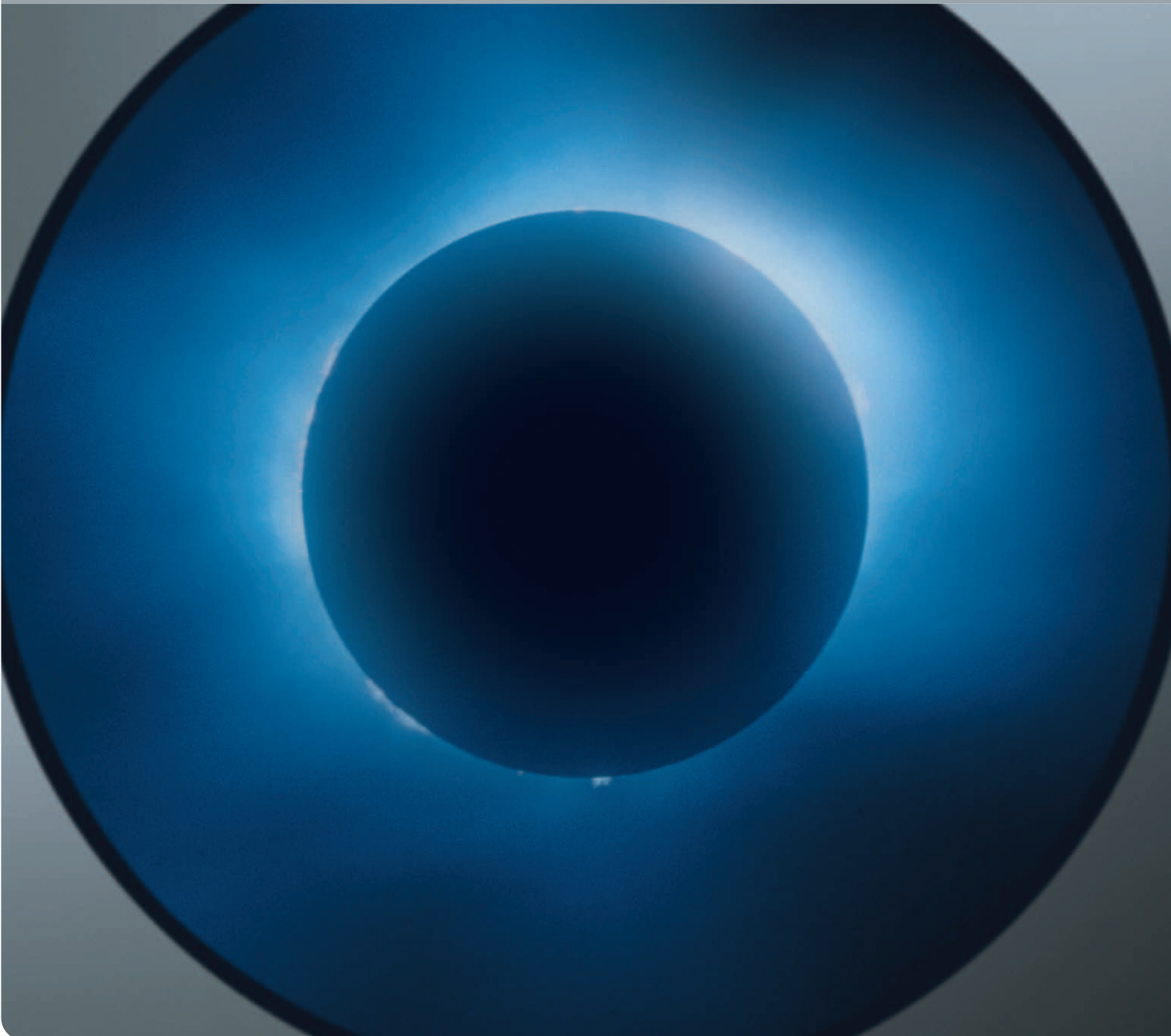


## Welding

More efficiency due to modern processes



## Pioneers in new processes

With a large range of proven and innovative welding processes, we at 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.

### Process variety in perfection

Excellent ignition behaviour, a quiet and stable arc and excellent weld seam qualities: 7 welding processes allow a variety of applications with very different materials. Clean Start, the special ignition routine developed by CLOOS, ensures a reliable and low spatter arc ignition for all processes.



## CLOOS: Your brand for innovative welding technology!

Providing added value for our customers! This is the motivational force behind our 700 employees.

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 optimized and adapted specifically to your product and production requirements.

CLOOS develops, manufactures and delivers innovative solutions to more than 40 countries worldwide. With our **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!

Leadership and competence equals process automation and welding at its best.

Whatever your needs are, we “Weld your way.”

CLOOS provides full service solutions – all from a single source!

Benefits of choosing CLOOS

- Unique and customised process and product solutions:
  - Delivering you more commercial success!
- High level of industrial and engineering competence:
  - We know what matters to you!
- Professional advice and a high level of global service quality:
  - From start to finish, we are with you all the way!
- Superior quality and technological know-how:
  - “Made in Germany” can be relied on

We offer optimised solutions with maximum efficiency and a high degree of welding and cutting products that are customised to your application. And we have been doing this for over 90 years!

**Cloos**  
Weld your way.



Additional information regarding QIROX® the system for automated welding and cutting can be obtained at [www.qirox.de](http://www.qirox.de)



**QIROX®**

Additional information regarding QINEO® the newest range of welding power sources can be obtained at [www.qineo.de](http://www.qineo.de)



**QINEO®**

## Controlled welding of thin plate

The Control Weld Process supplies a uniform arc which is particularly advantageous when welding thin steel. The classic industries are automotive construction, electronics, vehicle construction, heating technology, white goods and furniture. This process can also be used for reliable repair welding throughout all industry sectors and allows for welding under pure CO<sub>2</sub>.

### Applications

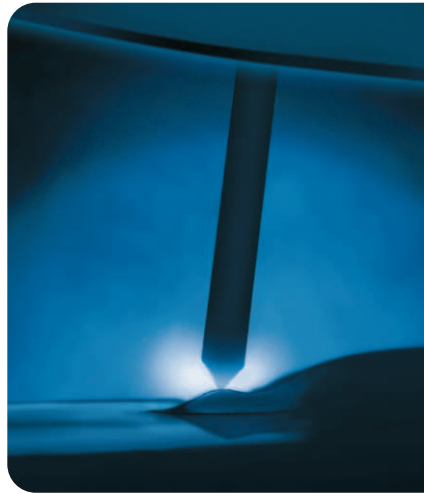
- Thin plate
- Welding under pure CO<sub>2</sub>
- Manual and automated welding, repair welding
- MIG brazing

### Advantages

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

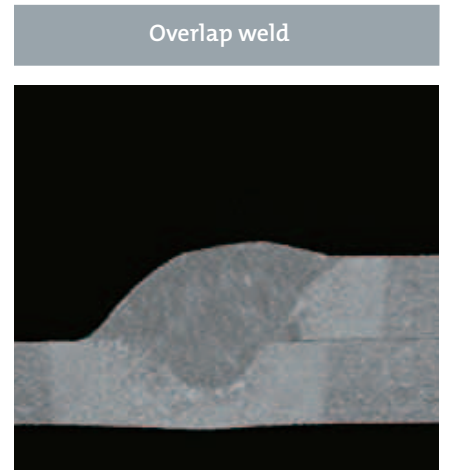
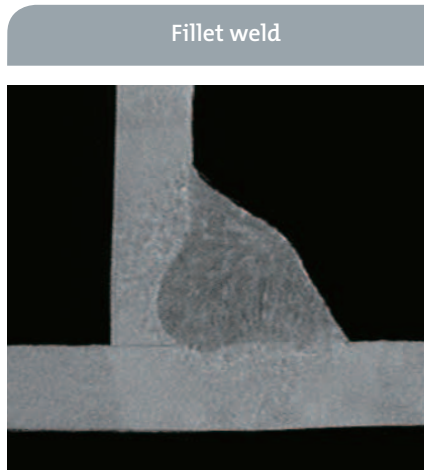
### Material

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



### Suitable power sources

- QINEO® STEP
- QINEO® TRONIC
- QINEO® PULSE
- QINEO® AUTOMOTIVE
- QINEO® CHAMP



### Technical Data

|                                    |           |
|------------------------------------|-----------|
| Material                           | S235      |
| Wire diameter Ø, mm                | 1.0       |
| Wire feed V <sub>D</sub> , m/min   | 4.2       |
| Weld speed V <sub>s</sub> , cm/min | 55        |
| Voltage U, V                       | 17.3      |
| Current I, A                       | 128       |
| Plate thickness, mm                | 1.5 / 1.5 |

|                                    |           |
|------------------------------------|-----------|
| Material                           | S235      |
| Wire diameter Ø, mm                | 1.0       |
| Wire feed V <sub>D</sub> , m/min   | 5.0       |
| Weld speed V <sub>s</sub> , cm/min | 70        |
| Voltage U, V                       | 17.4      |
| Current I, A                       | 126       |
| Plate thickness, mm                | 1.5 / 1.5 |

## Aluminium welding and MIG brazing

The Vari Weld process creates an extremely low spatter pulsed arc. Its special strengths are the welding of aluminium and MIG brazing, where due to the low temperature the base material remains metallurgically unaffected and the corrosion protection is maintained. This process offers completely stable arc conditions and an outstanding controllable weld pool even under varying external influences. The Vari Weld process can therefore be seen in all industrial sectors.

### Applications

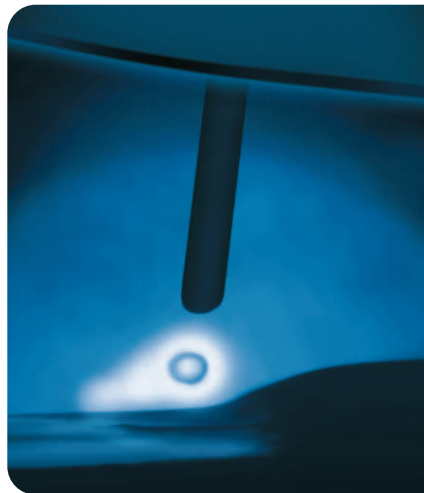
- MIG brazing of surface-coated or high-strength thin steel plates
- Manual and automated welding

### Advantages

- Optimum weld pool control
- Very low spatter drop transfer
- Completely stable arc conditions even under varying external influences

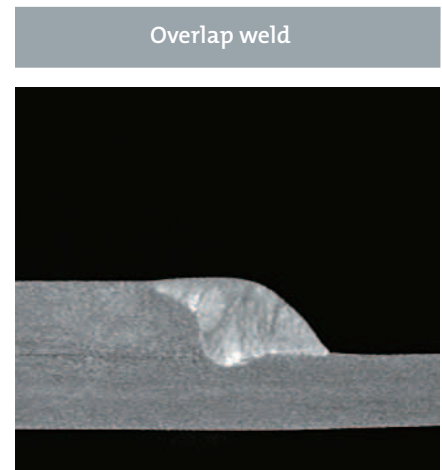
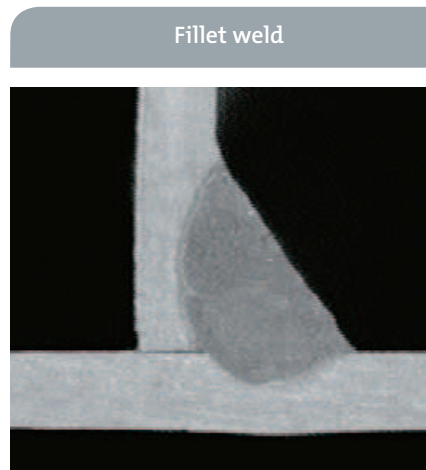
### Material

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



### Suitable power sources

- QINEO® PULSE
- QINEO® CHAMP



### Technical Data

|                           |           |
|---------------------------|-----------|
| Material                  | AlSi5     |
| Wire diameter Ø, mm       | 1.2       |
| Wire feed $V_D$ , m/min   | 4.0       |
| Weld speed $V_s$ , cm/min | 80        |
| Voltage U, V              | 17.5      |
| Current I, A              | 80        |
| Plate thickness, mm       | 1.5 / 1.5 |

|                           |           |
|---------------------------|-----------|
| Material                  | AlSi5     |
| Wire diameter Ø, mm       | 1.2       |
| Wire feed $V_D$ , m/min   | 4.0       |
| Weld speed $V_s$ , cm/min | 100       |
| Voltage U, V              | 19.0      |
| Current I, A              | 90        |
| Plate thickness, mm       | 1.5 / 1.5 |

## Welding with minimum heat input

With the Cold Weld process an alternating current produces a very special pulse form, which brings about an extremely low heat input. Due to this type of 'cold' arc welding the welding process can be optimally controlled. The material is only subjected to minimum heat and the original material properties remain to a large extent unchanged. This enables an excellent weld quality to be achieved with good gap bridging and increased weld speed. The Cold Weld process is mainly used with thin to medium sized plate thicknesses.

### Applications

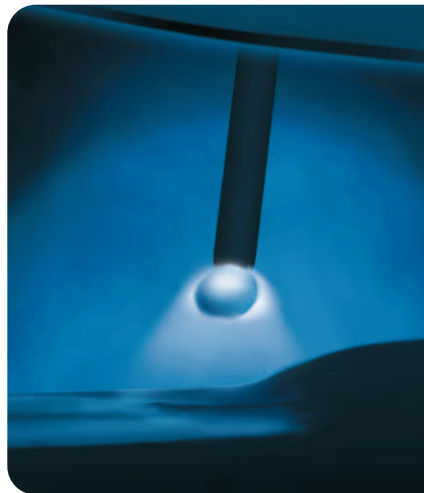
- Manual and automated welding
- Thin plate

### Advantages

- Minimum heat input
- Optimum weld quality
- Excellent control of heat input

### Material

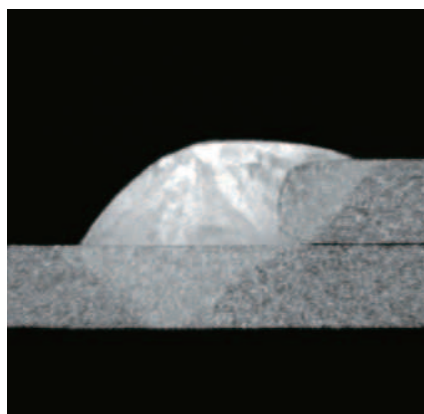
- Steel
- High-strength steel
- Aluminium
- Chrome-nickel materials
- Coated plate



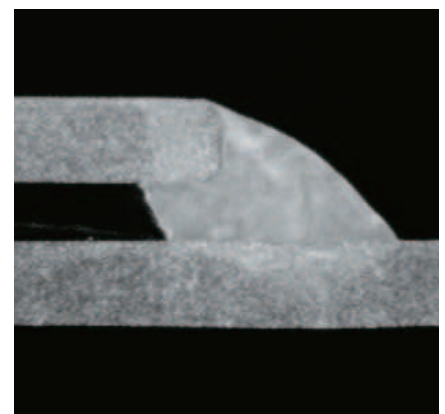
### Suitable power sources

- QINEO® CHAMP AC

Overlap weld



Overlap weld with gap



### Technical Data

|                                  |           |
|----------------------------------|-----------|
| Material                         | CuSi3     |
| Wire diameter $\varnothing$ , mm | 1.2       |
| Wire feed $V_D$ , m/min          | 4.5       |
| Weld speed $V_s$ , cm/min        | 80        |
| Voltage U, V                     | 16.5      |
| Current I, A                     | 132       |
| Plate thickness, mm              | 1.0 / 1.0 |

|                                  |           |
|----------------------------------|-----------|
| Material                         | CuSi3     |
| Wire diameter $\varnothing$ , mm | 1.2       |
| Wire feed $V_D$ , m/min          | 4.5       |
| Weld speed $V_s$ , cm/min        | 80        |
| Voltage U, V                     | 16.0      |
| Current I, A                     | 135       |
| Plate thickness, mm              | 1.0 / 1.0 |

# Speed Weld

## Special process for rapid welding

The Speed Weld process is most suitable for joining components with thin to thick plate thicknesses. Good penetration depths and perfect side wall joints at high weld speeds are achieved by means of a focused pulsed arc with a scaleable deposition rate. The Speed Weld process is used in all areas of industrial production.

### Applications

- Thin to thick materials
- Mainly automated welding, but also manual welding

### Advantages

- Good penetration depths at high weld speeds
- Perfect side wall joints
- High-quality weld seams

### Material

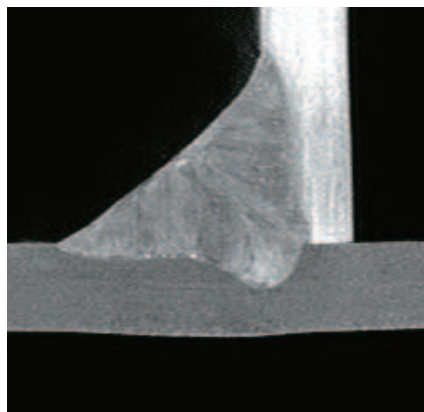
- Steel
- High-strength steel
- Aluminium
- Chrome-nickel materials
- Coated plate



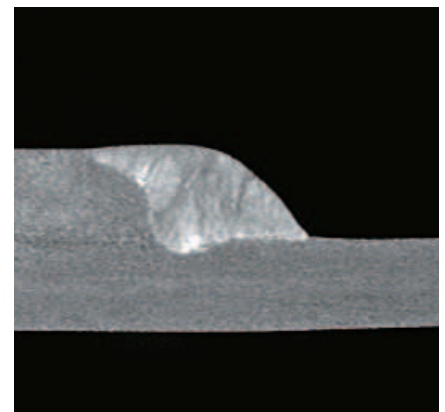
### Suitable power sources

- QINEO® PULSE
- QINEO® CHAMP

Fillet weld



Overlap weld



### Technical Data

|                                  |           |
|----------------------------------|-----------|
| Material                         | 1.4316    |
| Wire diameter $\varnothing$ , mm | 1.0       |
| Wire feed $V_D$ , m/min          | 5.8       |
| Weld speed $V_s$ , cm/min        | 80        |
| Voltage U, V                     | 21.0      |
| Current I, A                     | 130       |
| Plate thickness, mm              | 1.5 / 1.5 |

|                                  |           |
|----------------------------------|-----------|
| Material                         | 1.4316    |
| Wire diameter $\varnothing$ , mm | 1.0       |
| Wire feed $V_D$ , m/min          | 5.0       |
| Weld speed $V_s$ , cm/min        | 70        |
| Voltage U, V                     | 21.0      |
| Current I, A                     | 130       |
| Plate thickness, mm              | 1.5 / 1.5 |

## Quick but clean

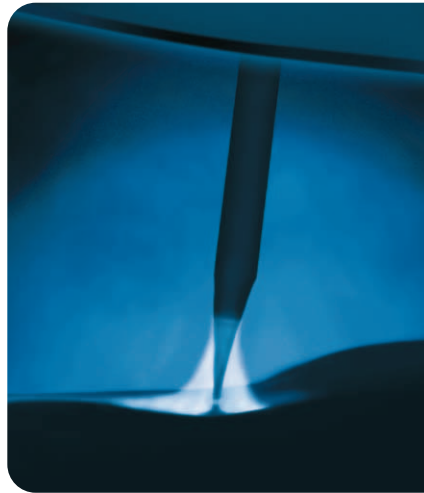
The Rapid Weld process provides advantages wherever high deposition rates and optimum penetration depths at high process speed are required. It is particularly suited for manual and automated applications in sectors such as the construction machine industry, shipbuilding, railway and container construction.

### Applications

- Thick steel materials
- Manual and automated welding

### Advantages

- Fast wire feed for high process speeds
- Deep penetration with high deposition rates
- Penetration profile can be regulated



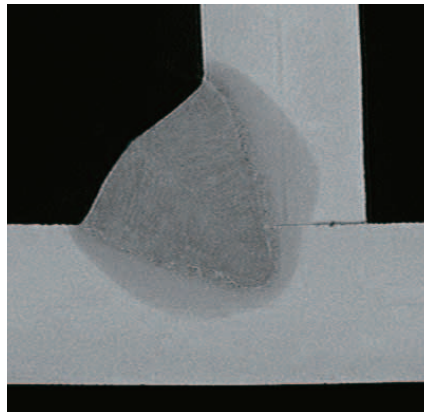
### Suitable power sources

- QINEO® PULSE
- QINEO® TRONIC
- QINEO® CHAMP

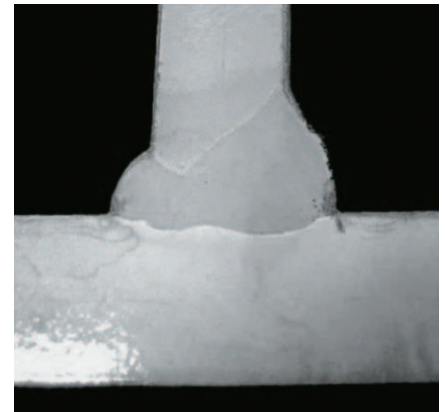
### Material

- Steel

Fillet weld



Fillet weld



### Technical Data

|                                  |             |
|----------------------------------|-------------|
| Material                         | S235        |
| Wire diameter $\varnothing$ , mm | 1.2         |
| Wire feed $V_D$ , m/min          | 12.5        |
| Weld speed $V_s$ , cm/min        | 52          |
| Voltage U, V                     | 33.0        |
| Current I, A                     | 360         |
| Plate thickness, mm              | 10.0 / 10.0 |

|                                  |            |
|----------------------------------|------------|
| Material                         | S235       |
| Wire diameter $\varnothing$ , mm | 1.2        |
| Wire feed $V_D$ , m/min          | 11.5       |
| Weld speed $V_s$ , cm/min        | 30         |
| Voltage U, V                     | 28.5       |
| Current I, A                     | 315        |
| Plate thickness, mm              | 8.0 / 10.0 |



# Tandem Weld

## The process for increased productivity

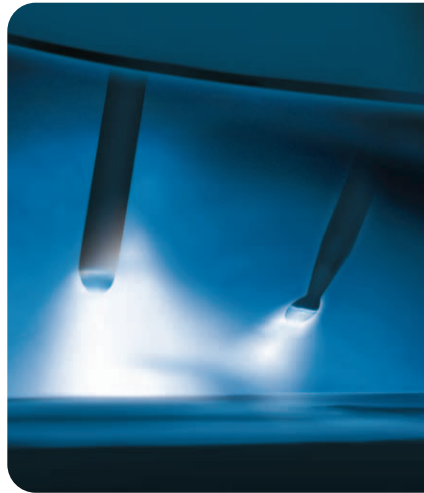
For Tandem welding two separately fed welding wires with separated potentials are fed together in a melt pool. Thanks to the consequent separation of the two power circuits, the welding arc can be fully controlled. The major advantages of the Tandem Weld process are extremely high efficiency, minimum heat input, excellent weld seam quality and extraordinarily high deposition rate.

### Applications

- Automated welding
- Thin to thick materials

### Advantages

- Extremely high weld speed
- Very high deposition rates
- Excellent weld quality, minimum risk of pore formation
- Low heat input
- Optimum arc control

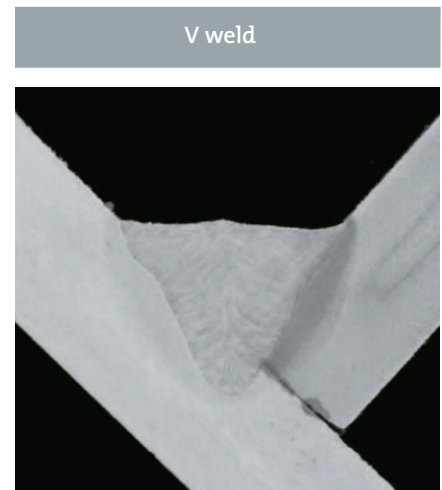
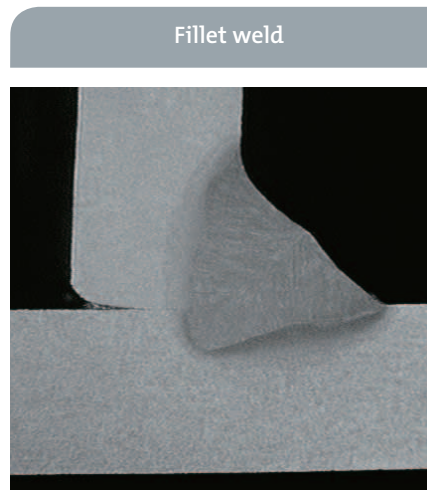


### Suitable power sources

- QINEO® CHAMP

### Material

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



### Technical Data

|                           |            |
|---------------------------|------------|
| Material                  | S235       |
| Wire diameter Ø, mm       | 1.2        |
| Wire feed $V_D$ , m/min   | 19.1 / 9.0 |
| Weld speed $V_s$ , cm/min | 140        |
| Voltage U, V              | 35.5 / 29  |
| Current I, A              | 445 / 240  |
| Plate thickness, mm       | 8.0 / 8.0  |

|                           |             |
|---------------------------|-------------|
| Material                  | S235        |
| Wire diameter Ø, mm       | 1.2         |
| Wire feed $V_D$ , m/min   | 22.0 / 13.0 |
| Weld speed $V_s$ , cm/min | 120         |
| Voltage U, V              | 31.8 / 32.8 |
| Current I, A              | 445 / 335   |
| Plate thickness, mm       | 8.0 / 8.0   |

## As efficient as never before

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. Moreover a high weld speed can be achieved when welding either thin or thick plate. Components for construction machinery, railway carriages and commercial vehicles as well as for the automotive industry are being produced today on CLOOS Laser MIG/MAG hybrid welding systems.

### Applications

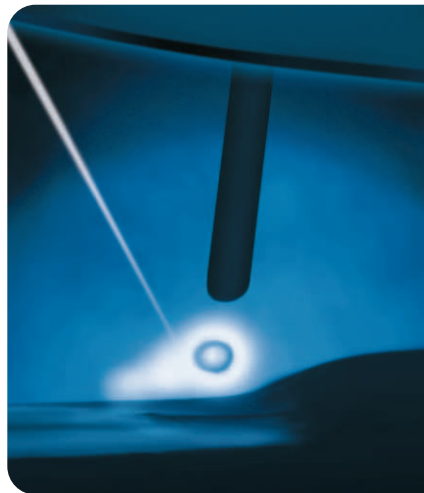
- Thin plate and medium sized materials
- Automated welding

### Advantages in comparison to MIG/MAG welding

- Increased productivity due to higher weld speed
- Reduced seam preparation with higher plate thicknesses
- Reduction in workpiece distortion because of a smaller heat affected zone
- Stable process due to process interaction

### Material

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

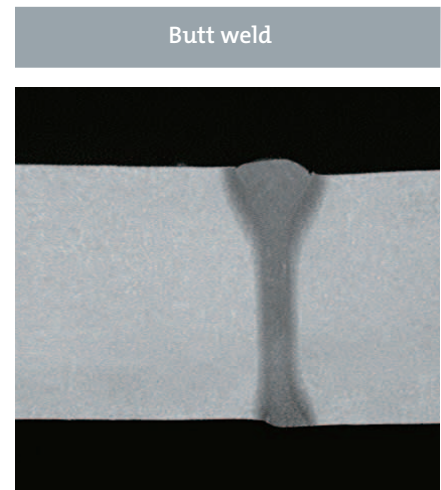
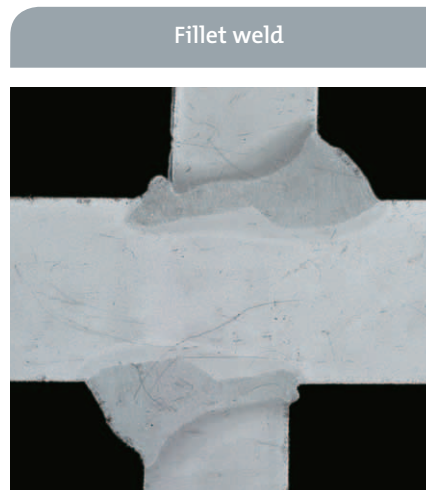


### Suitable power sources

- QINEO® CHAMP
- QINEO® PULSE

### Advantages

- Shorter processing time\*:  
Up to 57 %
- Less filler material\*:  
Up to 70 %
- High penetration depth via laser beam
- Safe side wall fusion due to MIG/MAG process



### Technical Data

|                                  |            |
|----------------------------------|------------|
| Material                         | S235       |
| Wire diameter $\varnothing$ , mm | 1.2        |
| Wire feed $V_D$ , m/min          | 10.0       |
| Weld speed $V_s$ , cm/min        | 85         |
| Voltage U, V                     | 27.0       |
| Current I, A                     | 260        |
| Plate thickness, mm              | 12.0       |
| Laser capacity P, kW             | 8.0 / 12.0 |

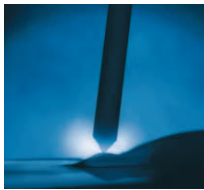
|                                  |      |
|----------------------------------|------|
| Material                         | S235 |
| Wire diameter $\varnothing$ , mm | 1.2  |
| Wire feed $V_D$ , m/min          | 11.0 |
| Weld speed $V_s$ , cm/min        | 150  |
| Voltage U, V                     | 27.5 |
| Current I, A                     | 280  |
| Plate thickness, mm              | 12.0 |
| Laser capacity P, kW             | 8.0  |

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

# Overview

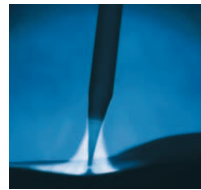
## Market lead due to expertise

CLOOS expertise in numerous welding processes can give you a decisive lead among your competitors. Use our proven know how in welding technology for the efficient processing of the most varied materials. CLOOS can provide the right QINEO® welding power source for all welding processes and requirements. You will benefit from the best quality, reliability and flexibility.



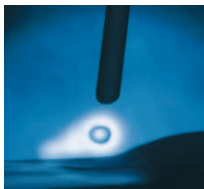
### Control Weld

- Thin plate, steel and high-strength steel
- Manual and automated welding, repair welding, also under pure CO<sub>2</sub>



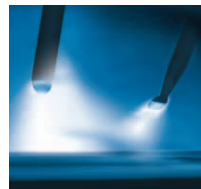
### Rapid Weld

- Thick steel and high-strength steel
- Manual and automated welding



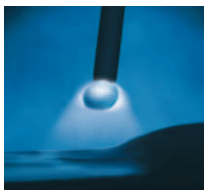
### Vari Weld

- High strength steel and coated plate, aluminium, CrNi materials
- Manual and automated welding, MIG brazing



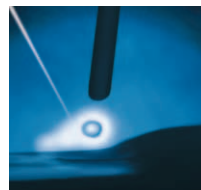
### Tandem Weld

- Thin to thick materials, steel, aluminium, CrNi materials
- Automated welding



### Cold Weld

- Thin plate, steel, aluminium, chrome-nickel materials
- Manual and automated welding



### Laser Hybrid Weld

- Thin to thick plate, steel, aluminium, CrNi materials
- Automated welding



### Speed Weld

- Thin to thick materials, steel, aluminium, CrNi materials
- Mainly automated welding, but also manual welding

## Overview

|                        | Control Weld | Vari Weld    | Cold Weld | Speed Weld | Rapid Weld | Tandem Weld | Laser Hybrid Weld |
|------------------------|--------------|--------------|-----------|------------|------------|-------------|-------------------|
| <b>Material</b>        |              |              |           |            |            |             |                   |
| Thickness              | 1* + 2*      | 1* + 2* + 3* | 1* + 2*   | 3* + 4*    | 3* + 4*    | 3* + 4*     | 2* + 3* + 4*      |
| Steel                  | ■            | ■            | ■         | ■          | ■          | ■           | ■                 |
| High-strength steel    | ■            | ■            | ■         | ■          | ■          | ■           | ■                 |
| Aluminium              | ■            | ■            | ■         | ■          | ■          | ■           | ■                 |
| CrNi materials         | ■            | ■            | ■         | ■          | ■          | ■           | ■                 |
| Coated plates          |              | ■            | ■         | ■          | ■          | ■           | ■                 |
| <b>Welding machine</b> |              |              |           |            |            |             |                   |
| STEP                   | ■            |              |           |            |            |             |                   |
| TRONIC                 | ■            |              |           |            | ■          |             |                   |
| PULSE                  | ■            | ■            |           | ■          | ■          |             | ■                 |
| CHAMP                  | ■            | ■            | ■         | ■          | ■          | ■           | ■                 |
| AUTOMOTIVE             | ■            | ■            |           | ■          | ■          |             | ■                 |
| <b>Sector</b>          |              |              |           |            |            |             |                   |
| Manual                 | ■            | ■            | ■         | ■          | ■          |             |                   |
| Auto                   | ■            | ■            | ■         | ■          | ■          | ■           | ■                 |

1\* very thin materials, 2\* thin materials, 3\* thin to medium materials, 4\* medium to thick materials



Weld your way.

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