

Deloro
Hettiger Welding



PTA WELDING SYSTEMS

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WORLD-CLASS PTA WELDING SYSTEMS BY DELORO HETTIGER WELDING

Deloro Group is a leading global manufacturer and provider of innovative metallic wear and corrosion protection solutions to enhance the performance of your critical components. **Deloro Hettiger Welding** is part of Deloro Wear Solutions GmbH, located in Koblenz, Germany.

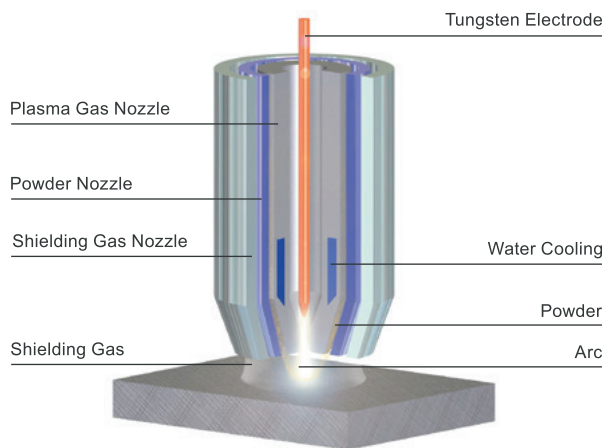
Hettiger Schweißtechnik GmbH was founded in Erlenbach, Germany in 1972 specializing in manual, semi-automatic and fully automated PTA welding equipment and was later integrated into the Deloro Group. In the year 2017, the prestigious name of “**Hettiger**” was re-established as the “Deloro Hettiger Welding” brand and recognized as a manufacturer of high performing, highly efficient and standard setting PTA welding machines made in Germany.

The strength of **Deloro Hettiger Welding** is to customize PTA welding equipment in close co-operation with our customers. We adapt our welding systems to individual needs and develop the processes for specific welding tasks. Easy to learn and easy to use Human-Machine-Interface, highest standards in machinery safety (European Machinery Directive 2006/42) and in combination with best of class quality, **Deloro Hettiger Welding** sets the standard in PTA welding machines.

PLASMA POWDER CLADDING TECHNOLOGY

Plasma-Transferred-Arc welding (PTA welding) technology is a thermal process for applying high-quality wear and corrosion resistant layers on surfaces of metallic materials.

Using a tungsten electrode for creating a highly energetic plasma arc with high energy density, the process melts the surface of the base material. At the same time, the powder filler material is fed into the arc, respectively, into the melt pool. During solidification, a metallurgical bond between the filler material and the base material is created.



The advantages of this process are

- low dilution rate with base material
- small heat-affected zone
- high deposition rate
- thin layer thickness of 2-3mm/layer
- low aggregated weight
- good surface quality
- limited need of machine finishing
- enhanced life-time of finished product

The PTA process is easily to be automated, providing a high degree of reproducibility of the weld overlays. PTA allows precise metering of metallic powder feedstocks, resulting in less material quantity used compared to other welding processes. PTA permits precise control of important welding parameters (i.e. powder feed rates, gas flow rates, amperage, voltage, and heat input), ensuring consistency from lot to lot. Controlled heat input ensures weld dilutions that can be controlled from 3-7%.

Deloro Hettiger Welding PTA systems

With a vast product range of latest technology equipment and accessories for PTA welding, we offer tailor-made solutions for all application requirements.

The **BASIC LINE** is designed for easy, safe and reliable manual operation and/or integration in existing handling systems. For fully automatic welding processes our **COMPACT LINE** is the perfect solution with power source up to 350A, standardized aluminum frame and single powder feeder. A customized solution for your individual needs and applications is available through our **PREMIUM LINE** with power sources up to 500A, customized steel frame and optional double powder feeder for individual powder handling. For specific requirements of fuel engine valve cladding e.g. in the automotive and diesel engine industry, the **VALVE LINE** provides a fully automatic processing system. High performing accessories enhance the overall superior quality of **Deloro Hettiger Welding** products. Reliability and throughput of our **torches** and **powder feeders** will convince you day after day.

BASIC LINE

PTA powder cladding unit for manual and automatic welding

The **BASIC LINE** was developed to offer a high-quality and reliable welding system for the integration in already existing welding equipment and as a standalone PTA equipment for manual use.

The robust and space-saving design integrates all necessary hardware components in one housing. Easy operation is ensured by a mobile hand-held device. Thanks to its modular design, there is an extension capability from manual to automatic welding.

The economical priced **BASIC LINE** and its modular extensibility offers a high-quality and reproducible execution of the welding process even under demanding production conditions.



FEATURES and BENEFITS

- **Power sources from 250 A - 500 A**
Individual selection of suitable power supply
- **Hand held torches for manual welding including foot pedal**
Safe and easy operation of equipment
- **Powder feeder**
Well-proven and reliable gravity wheel feeder
- **Machine torches**
For easy integration in existing manipulation system
- **Oscillation unit for torches**
Already integrated in the Programmable-Logic-Controller (PLC)
- **Optional electronic mass flow controllers**
Reliable gas management for automatic welding and integration in Programmable-Logic-Controller (PLC)

COMPACT LINE

Compact systems for PTA powder cladding

The **COMPACT LINE** is the preferred equipment for the cladding of small and medium-sized parts with a high-quality and reliable welding system with integrated torch and workpiece manipulation for easy PLC automated use.

The robust and compact design integrates all necessary hardware components in an aluminum frame. The easy operation is ensured by an integrated operation panel equipped with our standard-setting Human-Machine-Interface and PLC which controls all functionalities for the execution of the cladding process. This includes all welding parameters and the workpiece manipulation.

The fully automated **COMPACT LINE** combines the advantage of a highly sophisticated control unit with high-quality components for safe and reliable operation.



FEATURES and BENEFITS

- **Power sources from 250 A - 350 A**
Selection of power supply suitable for workpiece dimension
- **Machine torches**
Deloro Hettiger Welding designed torches for outer and inner cladding
- **Single powder feeder**
Well-proven and reliable gravity wheel feeder
- **Electronic mass flow controllers**
Reliable gas management for automatic welding integrated into the Programmable-Logic-Controller (PLC)
- **Up to 3 linear axes and 1 tilting and 1 turning axis**
Non-rotational geometries possible
- **Master-Slave-Programming**
Easy teaching and manipulation of welding task

PREMIUM LINE

Fully customized PTA powder cladding systems

The **PREMIUM LINE** is the answer to the most demanding welding task. From medium-sized to large-sized workpieces up to 12m in outer and 2m of inner length. This high-quality and reliable welding solution provides integrated torch and workpiece manipulation, powder change or mixing during operation and other customized features controlled by a central PLC.

The user-oriented design integrates all necessary hardware components either in a robust steel frame or adjusted to local conditions on site. Monitoring of the welding process by camera system and easy operation is ensured by an integrated operation panel with our standard-setting human-machine-interface and PLC. This controls all functionalities for execution of the cladding process including welding parameters and workpiece manipulation.

The **PREMIUM LINE** represents the ultimate solution for your individual welding task. Latest technology of human-machine-interface, high-quality components and durable design in compliance with highest standards of machine safety meets most demanding challenges.



FEATURES and BENEFITS

- **Power sources from 250 A - 500 A**
Selection of power supply suitable for workpiece dimension
- **Machine torches**
Deloro Hettiger Welding designed torches for outer and inner cladding
- **Single or double powder feeder**
Well-proven and reliable gravity wheel feeder
- **Electronic mass flow controllers**
Reliable gas management for automatic welding integrated in the Programmable-Logic-Controller (PLC)
- **Customized linear, tilting, turning and robotic axes**
Non-rotational geometries and operation on double workstation (parallel and serial) possible
- **Master-Slave-Programming**
Easy teaching and manipulation of welding task

VALVE LINE

PTA powder cladding system for fuel engine valves

The **VALVE LINE** provides a fully automatic processing system for the specific requirements of fuel engine valve cladding. Designed for the automotive and diesel engine industry and tailored to the individual welding task, a wide range of valve dimensions can be processed.

This high-quality and reliable welding solution provides integrated torch and workpiece manipulation and other customized features controlled by a central PLC. The specialized design combines all necessary hardware components in a robust steel frame. Easy operation is ensured by an integrated operation panel and PLC which controls all functionalities for execution of the cladding process. This includes welding parameters as well as valve loading and unloading.

The **VALVE LINE** has been installed at many manufacturers plants of valve seats around the world and has proven its reliability, productivity and superior cladding quality.



FEATURES and BENEFITS

- **Power sources from 250 A - 350 A**
Individual selection of suitable power supply
- **Machine torches**
Deloro Hettiger Welding designed torches for outer diameter cladding
- **Powder feeder**
Well-proven and reliable gravity wheel feeder
- **Electronic mass flow controllers**
Reliable gas management for automatic welding integrated in the Programmable-Logic-Controller (PLC)
- **Welding and manipulation axes**
Rotational mechanical axis for welding of seats with oscillating and pneumatic axis for loading/unloading
- **Loading and unloading of parts**
Optional manual or automated loading

HUMAN-MACHINE-INTERFACE

System for easy operation

The **Human-Machine-Interface** consists of an intuitive-to-use touch screen in combination with a switch panel for redundant operation of axis movement, welding current and powder parameters. The interface provides various authorization levels for operator administration by personalized RFID-key to assure secure operation of system.

The easy to learn HMI interaction is supported by a graphic display of pre-selectable geometries and teaching procedures. This enables the operator to set up a welding process within the shortest time.

A strength of the **Deloro Hettiger Welding** software is that it controls the whole machine set-up through one central interface. Geometries and movement profiles for individual welding tasks can be added and welding documentation can be adapted to company requirements.

FEATURES and BENEFITS

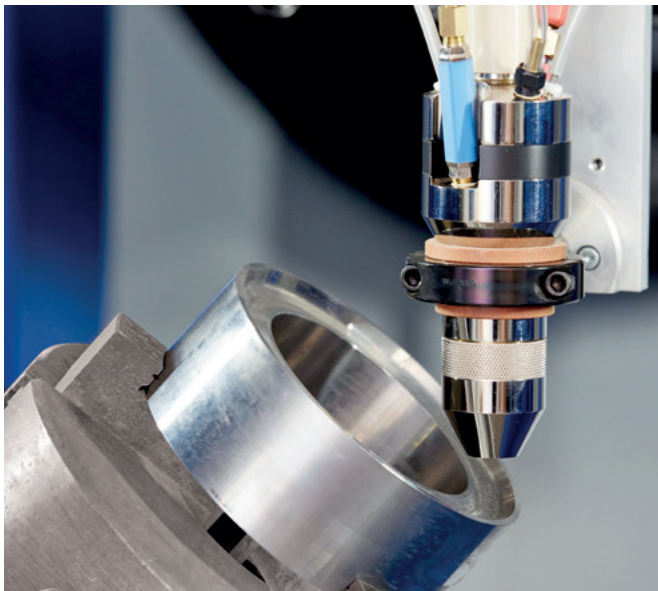
- **Easy-to-use Human-Machine-Interface**
Operator is intuitively guided through the set-up process
- **Easy machine set-up**
By pre-selectable geometries, movement and welding profiles
- **Master-Slave combination of axis**
Enables a fully automated welding of complex geometries
- **Parameter tracking and storage**
Chronological process visualization, quality assurance and documentation
- **Tele maintenance via internet**
Reduction of service and maintenance costs at site



TORCHES

Deloro Hettiger Welding designed torches for inner and outer diameter cladding

The **Deloro Hettiger Welding** torches are specially designed for user friendly and reliable operation. A range of torches dedicated for cladding of small structures up to heavy-duty applications are selectable.



Subject to the required welding task and powder material, various electrode diameters, powder and plasma nozzles are available. Various torch designs with coaxial ring and 2 or 4 boreholes can be selected for the individual welding task.

All torches will be supplied with a spare-parts-starter-kit and a hose-package individual in length.

FEATURES and BENEFITS

- **Application range of Deloro Hettiger Welding plasma torches**
Standard outside welding **HPM**, inner diameter welding **HPI**, blind-hole welding **HPS** and hand-held welding **HPH**
- **Water cooling system**
Additional outside cooling tube for hot working conditions available
- **Rapid shutdown of torch**
Protection of torch in case of dysfunction of cooling circuit
- **Fast coupling system for gas, powder, water and electricity**
Torch change without powder or water spill
- **High quality components**
For longevity and low maintenance

POWDER FEEDER

Our well-proven and reliable gravity wheel feeding system is designed for a clean and pulsing-free operation. The very precise metering system allows a pulsing-free feed rate of 2g/minute.

The transparent hopper allows easy control showing the amount of powder left inside. With an additional sensor the operator will be timely informed when low powder level is reached. In combination with the PLC, calibration of powder feed rate is made easily.

Diffusion tight hoses are used for all gas and powder tubes to prevent moisture in the feeding channels and so minimizing the risk of pores during the welding process.

FEATURES and BENEFITS

- **Double powder feeder**
Optional for **PREMIUM LINE** for powder change or mixing during operation
- **Tiltable powder hopper**
Easy powder change and fast discharging
- **Accuracy of powder feed rate**
Constant feeding without pulsing even at low feed rates of 2g/minute
- **Near-Process powder supply**
Fast switch of powder and less risk of clogging by synchronized movement of powder feeder with torch
- **Fast coupling system**
Torch change without powder spill



DELORO SERVICES

In addition to design and manufacturing of standard setting PTA welding equipment, Deloro Wear Solutions GmbH provides a wide range of services starting from the supply of welding consumables up to inhouse coating, casting and machine finishing.

PTA Equipment

- Customizing of PTA Equipment
- Sales of accessory and spare parts

PTA Services

- Maintenance and repair of PTA Equipment
- Tele-Maintenance via internet
- Upgrade of system software for additional welding tasks
- In-house training on PTA welding

Welding Consumables

- Sales of Cobalt based Stellite™ and Tribaloy™ powder for PTA, thermal spray coatings and Laser cladding as well as stick and wire electrodes
- Sales of Nickel based Deloro™ and Nistelle™ powder for PTA, thermal spray coatings and Laser cladding as well as stick and wire electrodes
- Sales of Iron-based hardfacing alloys

Engineered Components

- In-house casting, coating, hiping and machine finishing
- Engineering service

Quality System

Extensive quality systems assure that our product and process control meet your high expectations. Our facility maintains ISO 9001:2008 certifications and we hold numerous industry-specific qualifications. Our PTA welding equipment complies fully with the highest standards in machine safety in accordance with the European Machinery Directive 2006/42.

Deloro™ is a registered trademark of Deloro Wear Solutions GmbH
Stellite™, Tribaloy™, Nistelle™, Stelcar™, Jet Kote™ and Delchrome™ are registered trademarks of Kennametal Inc.



Deloro Coatings

Offering high-quality coating services utilizing a wide range of cobalt, nickel and iron-based alloys as well as tungsten carbide



Deloro Microfusione

Leading manufacturing services provider for highly-demanding air- and vacuum-cast super alloy investment castings



Deloro Wear Solutions

Offering bespoke components, coating services, consumables and equipment

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