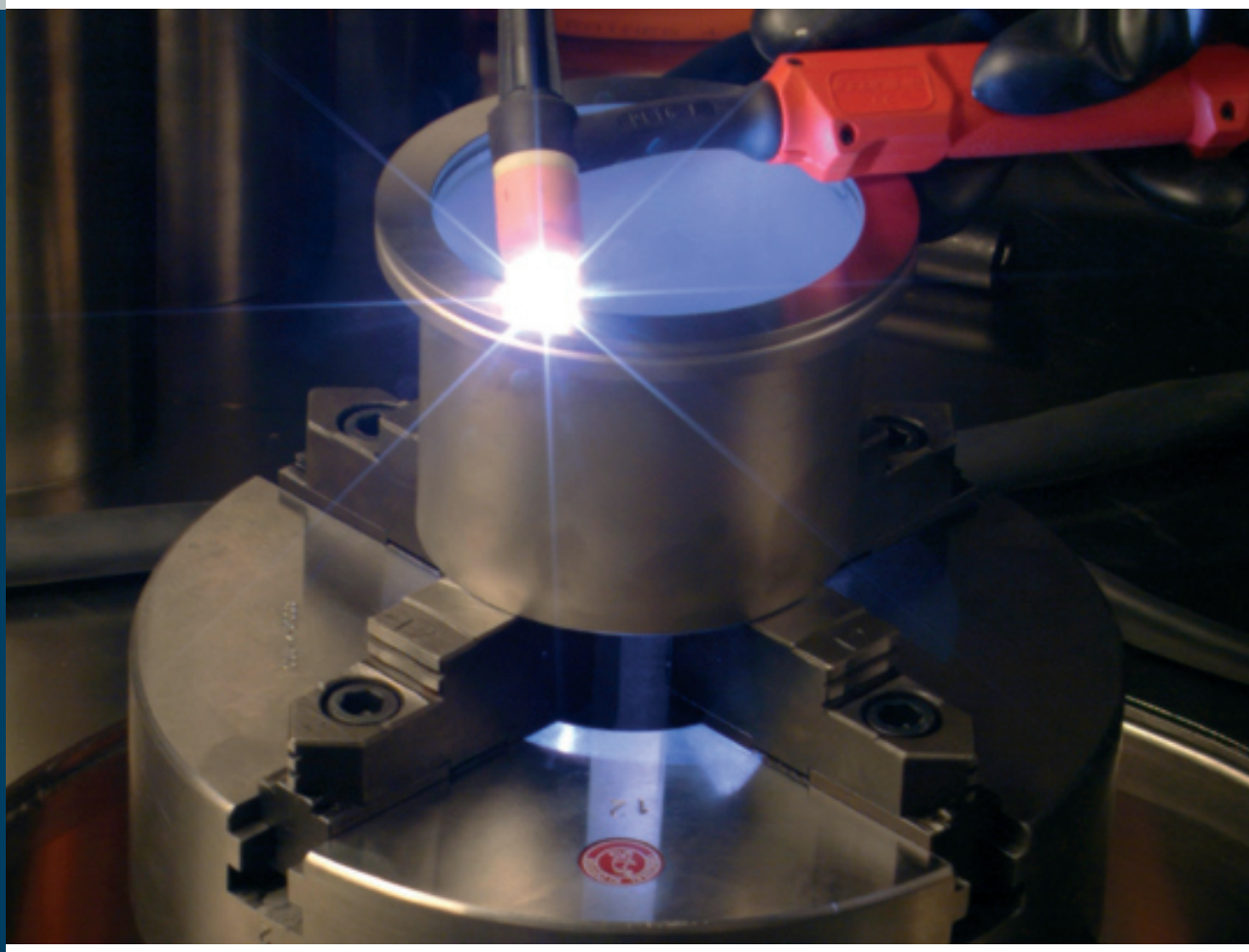


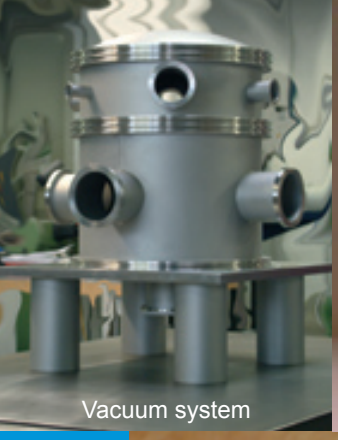




WELDING TECHNOLOGY

WELDING TECHNOLOGY




Vacuum system


Jewelry


Tantalum workpiece

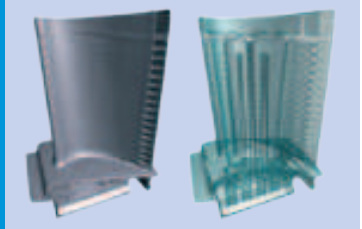

Smooth welds without addition of extra material


Gas-tight aluminium casing


Pacemakers


Stainless steel tube welded in MBRAUN glovebox

Same tube welded on air


Gas-tight aluminium casing


Hearing device


Main spring in watches

Various welding applications today require not only mechanical stability of the joint but also properties such as leak safety, minimizing impurities, absolute cleanliness, and smoothness of surfaces. These requirements are critical when applied to medical implants (pacemakers), microelectronic parts (amplifiers) or heavily loaded workpieces (turbine blades).

An argon gas shielding environment was applied relatively early to protect the molten metal from oxygen, moisture and nitrogen to reduce formation of oxides, toxic fumes and tarnishing of the metal surface. Manually operated shielding systems such as gas lenses, trailing shields and backing bars require highly experienced and specially educated personnel to adjust the correct shielding conditions. These methods are especially challenging and sometimes inappropriate. In particular titanium has the most stringent demands for purity of the shielding gas. Even at temperatures below the melting point, minor amounts of oxygen, moisture and nitrogen cause metal to become brittle. Any kind of coloration is evidence of chemical side reactions which take place between the base material and reactive components of the air despite every shielding effort.

Despite the precautions taken to avoid contamination, it is inevitable that manually operated shielding arrangements will occasionally fail to fully protect the weld.

Absolutely reliable exclusion of reactive gases and moisture in the welding environment is guaranteed when using MBRAUN inert gas enclosures. The concentrations of interfering components like solvent vapors, moisture, oxygen and nitrogen can be reduced to values below 1ppm. Although the use of these chambers looks quite cumbersome at first, the advantages are irrefutable: complete protection of the weld root and cap is provided regardless of joint geometry or component complexity. Rigid chambers are typically made of stainless steel and depending on the type of welding process incorporate handling systems, fume extractors and several clear viewing panes or radiation protection shields.

Starting from 'high-end'-applications such as welding of pacemaker casings, welding in inert gas enclosures shifts into more common areas. Simple applications such as welding of tubes can be performed in MBRAUN systems.

Thus the user of a MBRAUN inert gas welding box can assure advantages with product quality, a high grade of reproducibility, process monitoring, safety at work and lower cost of ownership compared to his competitors.

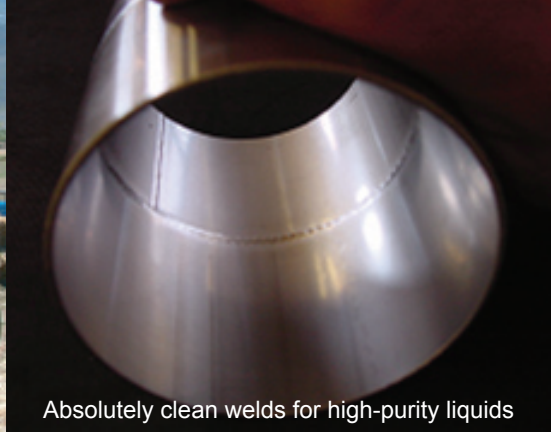
These advantages include:

Oxygen & nitrogen free welding environment:

- Prevention of oxide and nitrite formation
- Reduction of fume formation


Golf clubs


Framework of bikes


Absolutely clean welds for high-purity liquids

- Smooth weld seam
- Avoidance of post-welding treatment

- Complete removal of welding fume particles

- service pipe
- Particle removal systems with continuously operating segregation
- Integrated plasma burners which are often used for sealing off tantalum tubes.



MBRAUN
Welding Technology

For many years, MBRAUN has integrated equipment into our welding boxes according to customer specific requirements.

The MBRAUN welding team is looking forward to consulting with you to find the optimal configuration for your welding application.

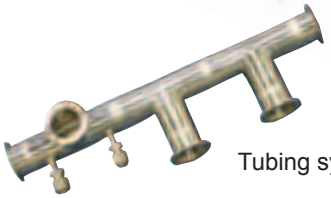
Moisture free welding environment:
- No physisorbed water on the base metal
- Clean (bubble free) weld seam
- Parts can be pretreated in a heated antechamber to remove adsorbed water

Closed inert gas system:
- Reproducible, well-defined, recordable welding environment conditions assure a controlled welding process
- Highest quality standards for the end product
- No waste of expensive inert gas (recirculation and purification principle of MBRAUN gloveboxes)
- No release of toxic alloy components
- Geometrical complex parts can be welded without additional shielding efforts
- No loss through waste because of inappropriate gas shielding

In addition to our standard welding boxes, MBRAUN offers the following inert gas component products:
- Customized systems for resistance welding
- Laser welding boxes with laser vitrification
- Plasma welding boxes with nitrogen free argon atmosphere
- Special feedthroughs for every kind of

Exhaust systems




Tubing system

MBRAUN TIG Welding Station



MBRAUN

TIG Welding Station

- Every kind of TIG welding equipment can be easily connected
- Integrated eye-protection shield
- Broad range of handling systems available
- Solvent & nitrogen removal option
- Monitoring of welding atmosphere with PLC control

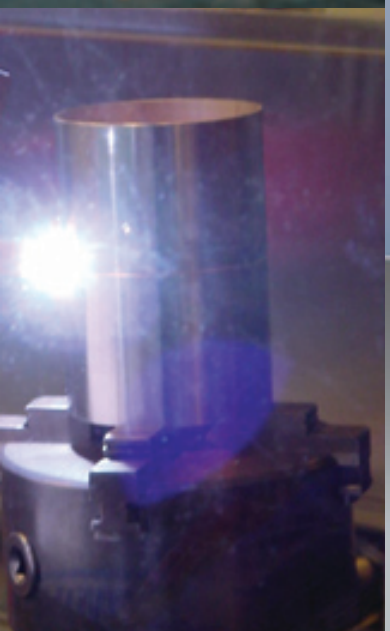
Unilab series







O_2, H_2O <1 ppm
optional
N_2 < 1ppm



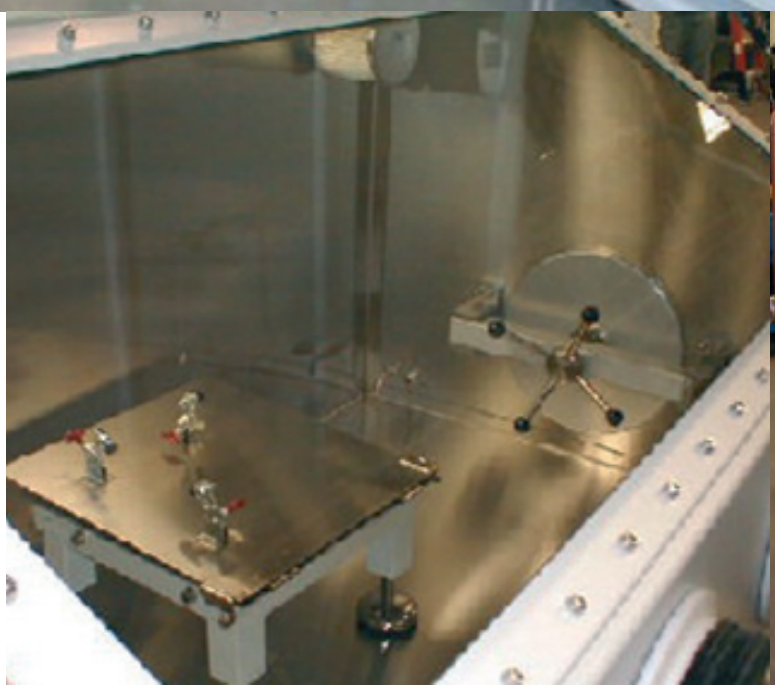


MBRAUN TIG Welding

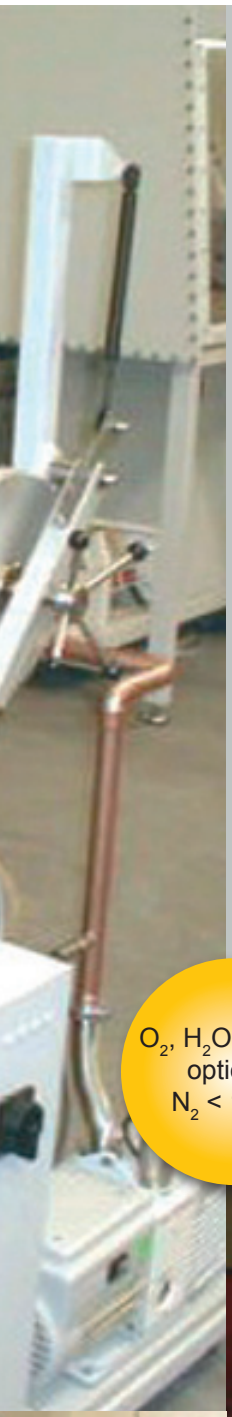
MBRAUN TIG WELDING

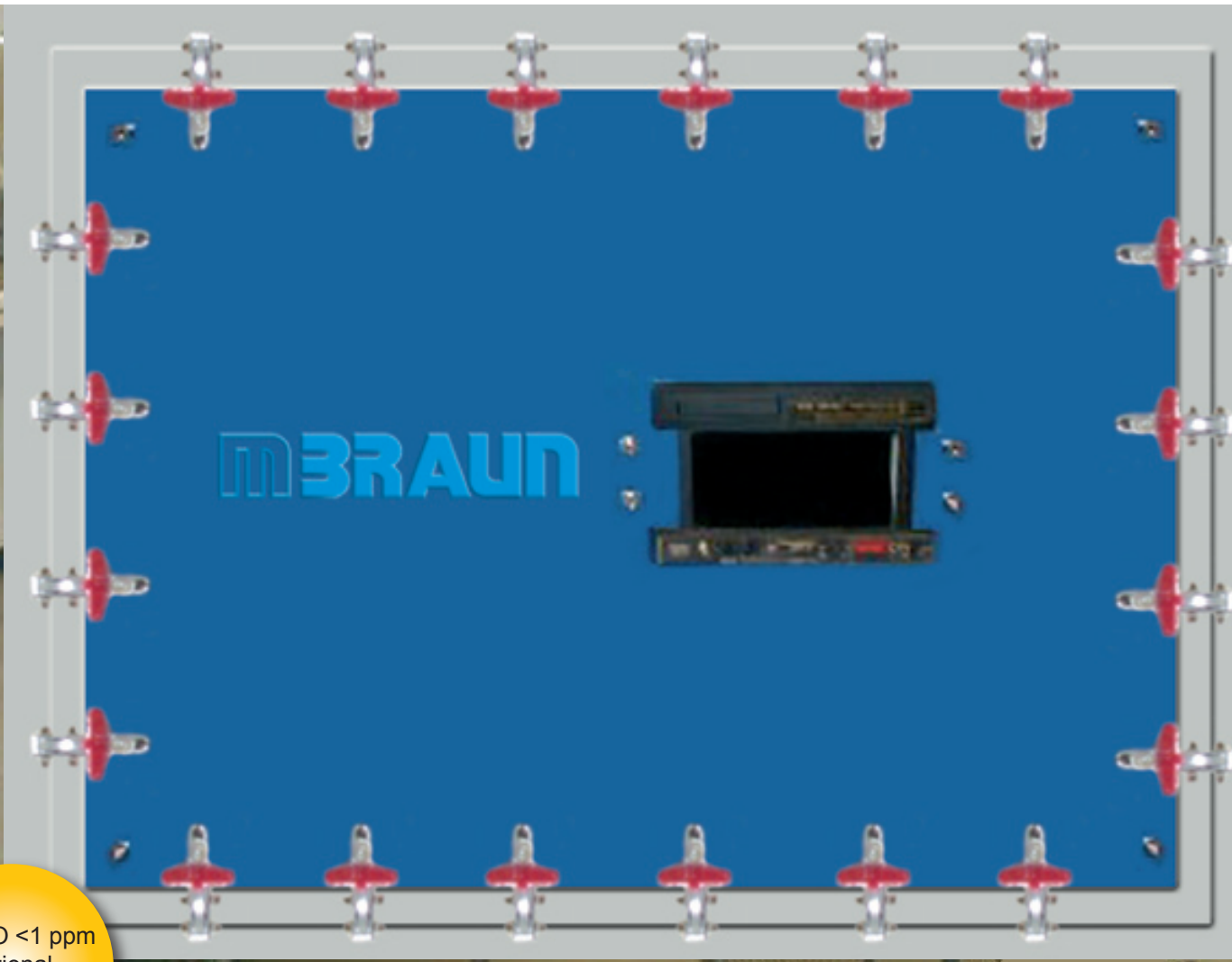
Hinged window type

- Monitoring of welding atmosphere with PLC control
- Hinged eye-protection shielding
- Easy to access service door with quick connection system
- Integrated handling systems available
- Inclined front window (60°) for ergonomic working position





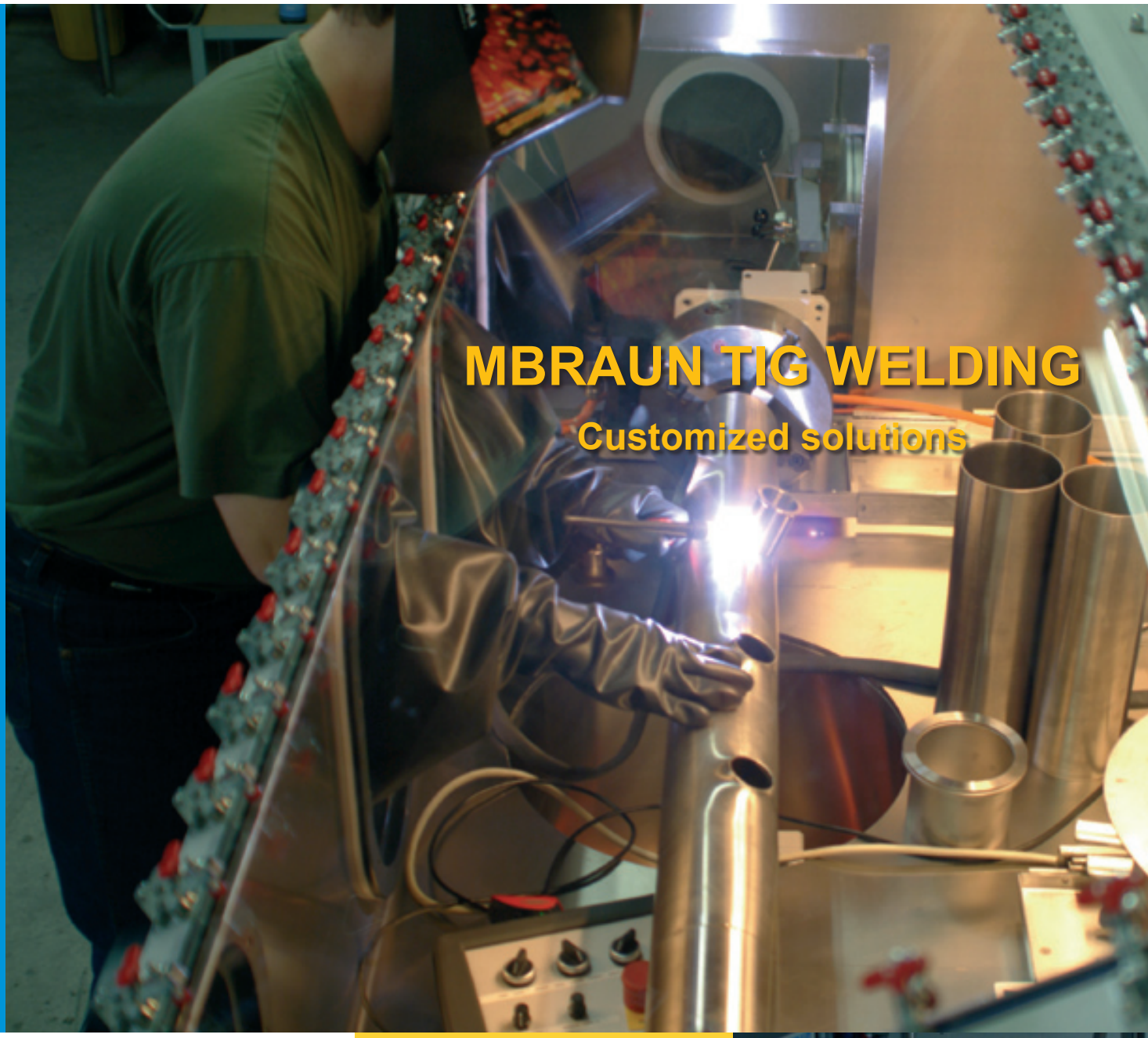




O_2, H_2O <1 ppm
optional
N_2 < 1ppm



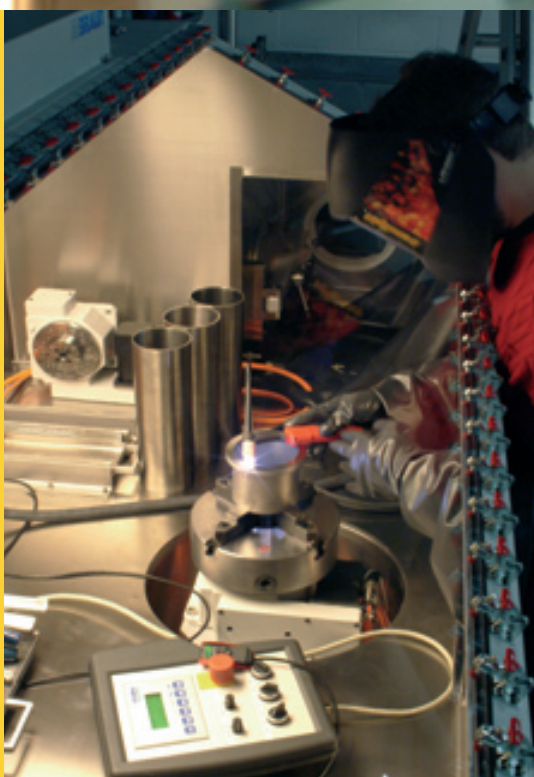




MBRAUN TIG WELDING

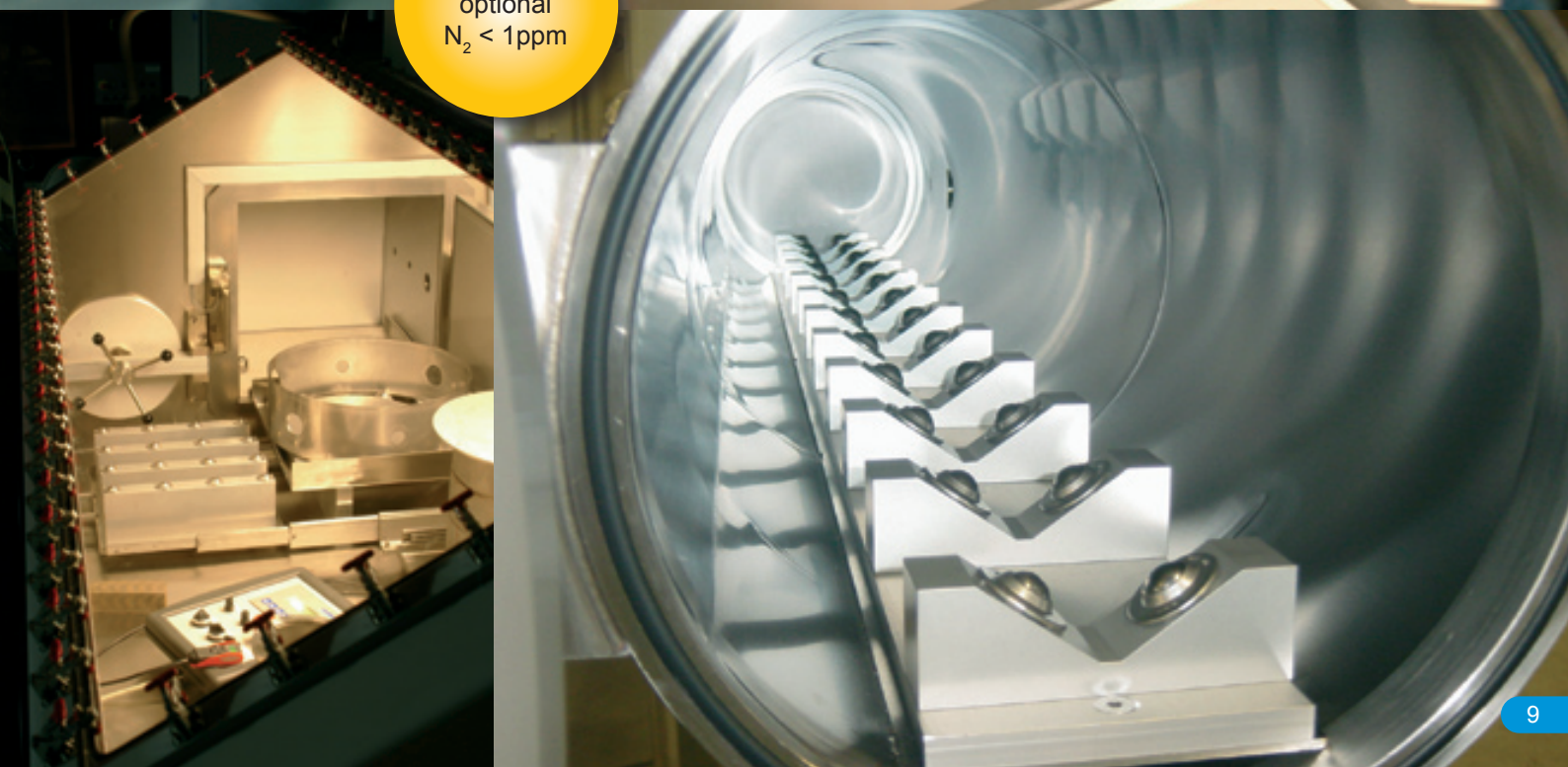
Customized solutions

- Multiple handling systems available
- Nitrogen removal unit
- Inclined front window (60°) for ergonomic working position
- Fully automatic gas purification unit
- Special oval shaped gloveports for optimal workpiece handling
- Various custom antechambers are available
- Integrated bearing tracks for handling
- Front window with quick connect system





O_2, H_2O <1 ppm
optional
N_2 < 1ppm



MBRAUN Laser Welding Station



MBRAUN LASER WELDING STATION

with integrated CO_2 Laser

- Integrated Ar-He mixing unit
- Hinged laser protection shield
- Fully automated antechamber doors with interlock feature
- Customized slide-in trays
- Two high temperature ovens
- Separated welding and quality control sections
- Quick connect windows
- Safety interlocks Class 4
- Integrated microscope for inspection
- PLC controlled welding atmosphere
- Integrated particle removal system
- Inert gas ovens for preheating and annealing of workpieces



MBRAUN LASER WELDING STATION

with integrated ND: YAG Laser





O_2, H_2O <1 ppm
optional
N_2 < 1ppm





MBRAUN WELDING ACCESSORIES



CleanJet series

Integrated particle removal system and Ar-He-mixing unit

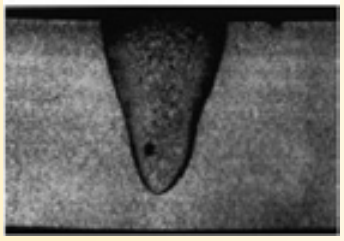


Stand alone unit

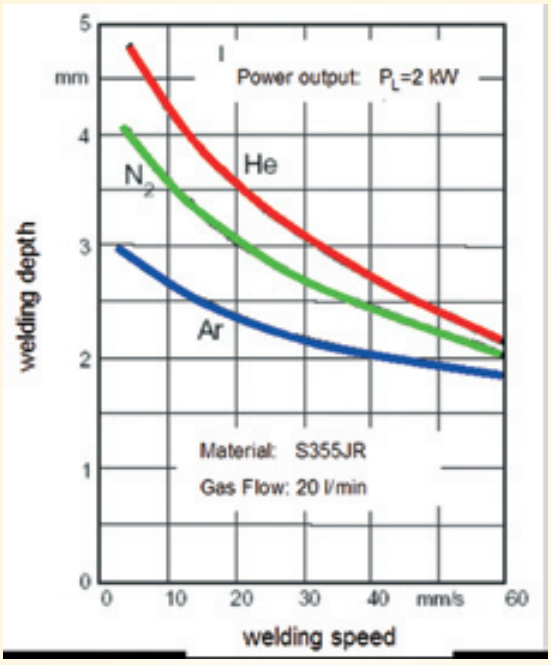
- Vacuum particle removal system
- Available in different sizes
- Available as stand-alone units or glovebox integrated systems

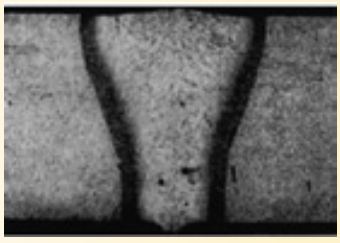
Argon-Helium mixing unit

- Helium atmosphere in welded component for easy leak checking
- Influencing the cross section of weld seam



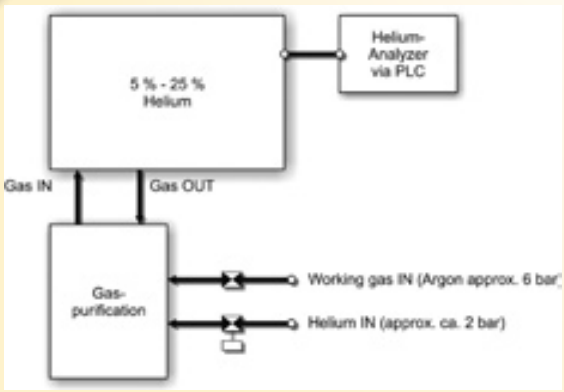
Cross section view of weld seam made under pure argon atmosphere





Cross section view of weld seam made under pure helium atmosphere

O_2, H_2O <1 ppm
optional
N_2 < 1ppm







- Precise adjustment of Argon-Helium mixture
- Easy to use
- Self-explanatory
- Maintenance free

Welding Service



MBRAUN welds your workpieces!

- TIG welding
- Limited lot production
- Prototype welding
- Welding in specially designed TIG welding inert gas enclosure
- Fast delivery time
- Welding conducted by highly experienced and certified welding experts
- No loss through waste because of insufficient gas shielding
- Extremely high reproducibility

NEW!

Send in your workpieces to the following address and give us the chance to convince you of the advantages of welding in MBRAUN gloveboxes.

M. Braun Inertgas-Systeme GmbH
Dieselstr. 31 • D-85748 Garching
GERMANY



O_2, H_2O <1 ppm
and
N_2 <1 ppm

We are only a phone call away!

Germany

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