



**Weil  
Technology**

**Laser technology for the  
production of metallic  
bipolar plates**

For prototypes and  
series production

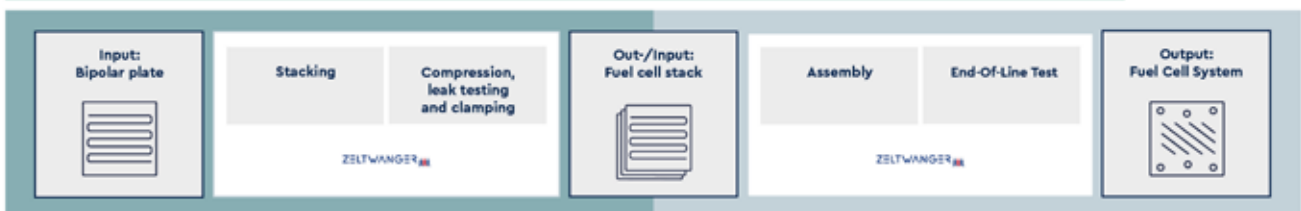


# Well positioned for tomorrow

New mobility concepts require new approaches in terms of development and construction. This is where our pioneering applications in the field of fuel cells and e-fuel technology come into play.

Benefit from our knowledge and experience of products in the field of laser cutting and laser welding, for example for the production of bipolar plates in series or for prototypes. We are at your side as an experienced technology and system partner.

Partial process bipolar plate



Partial process fuel cell stack

Partial process fuel cell system

## GERMAN FUEL CELL COOPERATION

In addition to laser cutting and laser welding, coating and final testing technology are important factors in the production of bipolar plates. In the GERMAN FUEL CELL COOPERATION, together with VON ARDENNE and ZELTWANGER, we offer you the knowledge and expertise of the three companies for every step in the process chain. This is how you get your fuel cell of the future.

VON ARDENNE specializes, among other things, in coating technologies based on physical vapor deposition (PVD). They produce coatings with reliable adhesion and improved electrical properties. ZELTWANGER is a leader in leak testing procedures with specially developed measuring systems and test circuits.

Together we offer you the option of producing bipolar plates in series or as prototypes for your development. Take advantage of our concentrated expert know-how and receive the complete process chain as a finished solution tailored to your application, which impresses with its efficiency in terms of raw material use and costs.

# Laser cutting and laser welding of bipolar plates

Bipolar plates, central elements of a fuel cell, are usually made of thin-walled stainless steel or titanium sheets and have a complex structure of flow channels and lines for the transfer of liquids and gases, which place special demands on a good seal, process time and reproducibility.

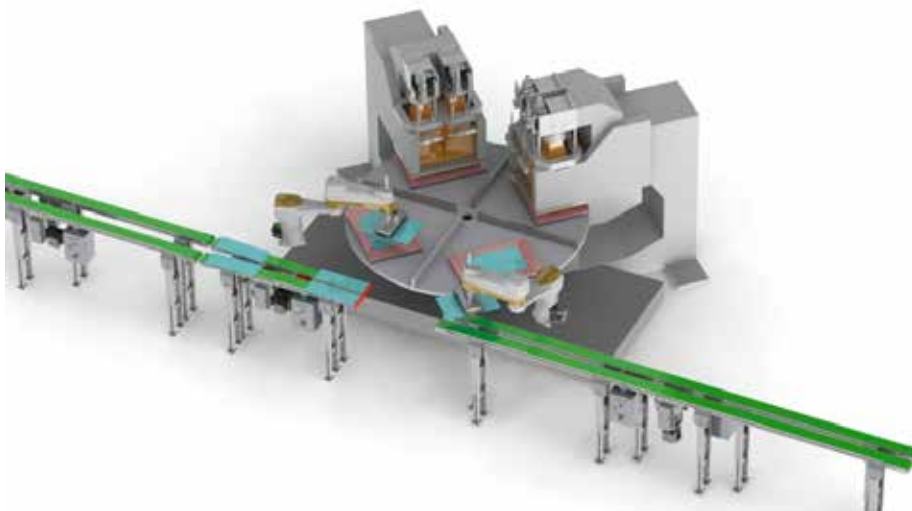
## Your benefits with laser welding as a joining process

- 100 % gas seal
- contour accuracy of 0.05 mm
- process-stable joining method for series production
- lowest heat input for minimum distortion
- maximum speed

For flexible cutting of the plates we offer laser cutting. By using laser technology, you avoid the use of high-maintenance tools and react flexibly to contour changes.

## Your benefits with laser cutting

- contour accuracy
- burr-free cutting and a homogeneous melt-off edge
- cutting speed
- high system dynamics and automation
- qualifying



## ... for your prototypes – manufactured by us

In our TechCenter we manufacture your bipolar plates for you in our prototyping department. We weld using the technology of our series module, which creates the best conditions for the validation of your series process.

### **Our services in prototype production**

- Contour cutting of the individual plates by laser
- Laser welding of the bipolar plates
- Leak test via our technology partner
- Design and manufacture of the clamping device

In addition our TechCenter offers advice concerning welding-compatible component design, investigations into process stability, the development of laser-compatible clamping technology, the validation of components and the manufacturing of prototypes / pilot series production.

## ... for highest demands in series production

For our production solution, we rely on innovative laser scanner technology. With the patent-pending welding module, we achieve welding speeds of 1000mm/s with maximum process reliability, allowing you to realise a high output level in a compact installation space. The system is equipped with tool holders for interchangeable tools and offers you a high degree of flexibility.

### **Your benefits**

- Large usable working area of 500 mm x 350 mm
- High absolute welding speed of 1000 mm/s
- Welding of stainless steel and titanium
- Excellent integration potential into a line concept

# Laser welding

## Optical inspection

- optical inspection of the coating for homogeneity/defects
- checking the orientation of the plate before loading

## Loading/unloading handling

- high loading and unloading speed with Scara robot and flexible gripper system for different plate formats

## Clamping technology

- maximum precision of the clamping technology through innovative centering
- short set-up times when changing the head and bottom tools
- for panel formats up to 500 mm x 165 mm double machining in one tool possible

## Scanner technology

- large usable working area of 500 mm x 350 mm with static scanning field
- high absolute welding speed of 1000 mm/s
- lower thermal distortion due to symmetrical heat input
- integrated vision systems for contour path accuracy 50µm or less

## 4-station concept

- 4-station production line with two welding tools in a small footprint

## Line capability

- design of hardware and software interfaces for maximum integration capability in production lines

# Contact

Would you like a personal consultation with our experts or information about our products and services?

We will be happy to advise you individually and free of charge on your manufacturing potential. Please contact us!



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