

BPP Manufacturing (graphite)



Assembly and production of the BPP (Bipolar plates - graphite)

Turnkey BPP manufacturing line

Our portfolio includes the automated production of bipolar plates, sealant application and end-of-line testing. Developed transport solutions between production and stack assembly enable the efficient transfer of components.

For the manufacturing of the BPP, we collaborate with our partners to supply the complete value chain. The stations for molding the monopolar plates are delivered by our collaborators, who specialize in manufacturing these stations.

Our value chain begins with the acceptance of the manufactured monopolar plates, which are either taken directly from the casting tools or from containers into the process.

These MPPs are then deburred, cleaned, e.g. with plasma, and inspected using a 2D / 3D camera. Using for example a dispenser or doctor blade coating, two precisely aligned MPPs are bonded together to form a BPP. The subsequent curing of the adhesive is triggered by heat or UV radiation. A leak test is performed to check the manufactured bipolar plates for leaks. This is followed by the transfer to the following stack assembly.

The bipolar plate production lines are scalable and designed for a capacity of up to 50,000 stacks per year, with around 300 to 400 bipolar plates being installed per stack. This requires an output rate of around one bipolar plate per second and a total number of up to 20,000,000 bipolar plates per year.

Innovative Solutions for BPP Manufacturing (graphite)



Molding MPP

- Support customers with our network of suppliers and manufacturers by selecting suitable powder applications (e.g. thermoset, epoxy resin) with the appropriate processing technology

Gluing and Sealant application

- Support customers with our network of suppliers and manufacturers by selecting suitable adhesives and sealants with the appropriate processing technology

Vision check 2D / 3D

- Camera system solutions check the elements for geometry and contamination in the μ -range
- Detect manufacturing errors at point of origin
- Geometry / contamination test in 1Hz-cycle in flow process

Leak testing BPP

- The manufactured bipolar plates must be absolutely watertight against leakage of cooling water and passage of process gas between the anode and cathode chambers
- Leakages of less than / equal to $1 \cdot 10^{-4}$ mbar l/s are considered watertight
- These leakages can only be measured precisely and quickly by using tracer gas

Data Acquisition and Line Control

- DATA ACQUISITION AND LINE CONTROL: The Advanced Data Management system (ADM) is a mixture of a Manufacturing Execution System (MES), Supervisory Control and Data Acquisition (SCADA) tool, which controls your production and evaluates your manufacturing and quality data
- It can be connected with additional production lines like MEA-/ BPP-manufacturing, Stack-Assembly, etc. for a holistic production control

What we stand for...

- Experience and Expertise in the field of hydrogen technology for over 10 years
- Delivery of professional pre-project consulting services
- Experiences in investment cost and support in complete factory planning
- Serving the entire production value chain alongside our partners and supplier network
- Innovative products and design concepts for customized requirements
- Reliable turnkey solution provider for manual or mass production systems

We are the **H** of Hydrogen

Contact

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BPP Manufacturing (metal)



Assembly and production of the BPP (Bipolar plates - metal)

Turnkey BPP manufacturing line

Our portfolio includes the automated production of bipolar plates, sealant application and end-of-line testing. Developed transport solutions between production and stack assembly enable the efficient transfer of components. For the manufacturing of metallic bipolar plates, we cooperate with partners to supply the complete value chain.

The process steps are divided into the precise forming of stainless steel sheets to produce monopolar plates, which are then welded to bipolar plates. These processes are provided by our partners. Our value chain begins with the jointed integration of cleaning and coating solutions, followed by the acceptance of the manufactured bipolar plates, which are either taken directly from the coating station or from containers, if delivered separately, into the process.

This is followed by the requirement to check the bipolar plates for leaks, apply the seals and check the seal contour and possibly the entire geometry of the plates 3-dimensionally on the anode and cathode side. Then follows the transfer to the following stack assembly.

The bipolar plate production lines are scalable and designed for a capacity of up to 50,000 stacks per year, with around 300 to 400 bipolar plates being installed per stack. This requires an output rate of around one bipolar plate per second and a total number of up to 20.000.000 bipolar plates per year.

Innovative Solutions for BPP Manufacturing (metal)



Forming MPP

- Support customers with our network of suppliers and manufacturers by selecting suitable innovative pressing processes

Welding

- Support customers with our network of suppliers and manufacturers by selecting suitable welding processes with the highest welding quality

Coating

- Graphitic or metallic coating in flow process

Vision check 2D / 3D

- Camera system solutions check the elements for geometry and contamination in the μ -range
- Detect manufacturing errors at point of origin
- Geometry / contamination test in 1Hz-cycle in flow process

Leak testing BPP

- The manufactured bipolar plates must be absolutely watertight against leakage of cooling water and passage of process gas between the anode and cathode chambers
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