

MEA Assembly



Membrane Electrode Assembly

The manufacturing of an MEA is a highly complex sequence of individual process steps. Due to the high quality requirements within the finished fuel cell, exact component positioning and the bonding processes of the individual layers are of particular importance in MEA production.

Our equipment portfolio is designed to meet exactly these challenges. We offer tailored solutions for every production phase, you can either manufacture MEAs manually or produce MEA elements in a semi or full automated system with a high and reproducible accuracy.

Manual to small series production

As an introduction to MEA production, our customers often choose a manual assembly solution in the beginning. When output requirements rise to medium scale production, we provide automated pick-and-place solutions to meet the demand. Here, the individual processing operations are largely decoupled from each other and the components are transported from one processing station to the next. This structure allows a very high degree of flexibility in the component variance that can be produced.

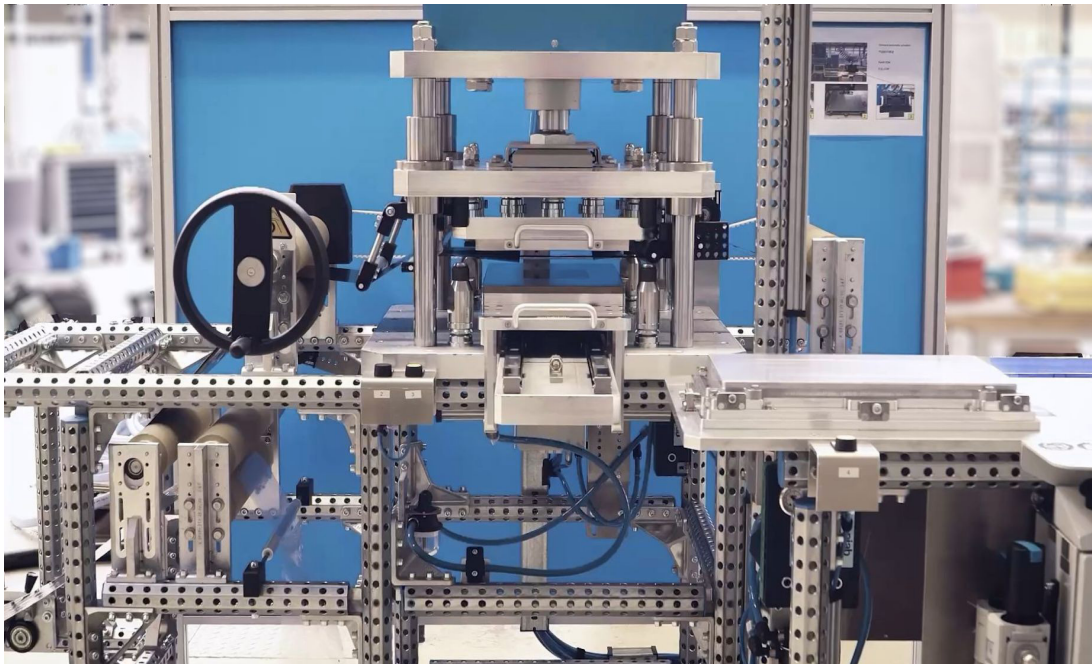
Such systems are particularly well suited for research and development phases, as they allow quick adaption to changes in product design or component geometry without long changeover times. Our pick-and-place solutions achieve cycle times of 10 seconds. Corresponding to an output of up to two million MEAs per year.

Roll-to-roll process for large series

Once the production processes are established, component development is sufficiently stable and expected sales are known, roll-to-roll processes can show its full strength.

Krause Automation has developed a high-speed roll-to-roll process for these high-volume output that combines all individual components into a finished MEA. The individual components are unrolled and, depending on the shape, punched or cut out, then laminated and checked for quality. With a cycle time of approx. 1s, an output of up to 20 million MEAs per year is possible.

Innovative Solutions for Membrane Electrode Assembly



Manual MEA assembly

- Low-cost-solution for early production trials
- Pick-and-Place solution
- Cycle time about 10-20s
- Very high degree of flexibility in the component geometries
- Short changeover times
- Output of up to 2 million MEAs per year

Roll-to-Roll process

- Cycle time about 1s
- Approach for mass production
- Unroll and cut experience of thin material / foils
- Experience with various MEA materials / cut operations
- Proven quality for unroll and cut operations
- Output of up to 20 million MEAs per year

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 MEA

- Depending on the helium / air permeability of the MEA, we offer vacuum leak testing with test gases or pressure difference methods for leak testing

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

We are the **H** of Hydrogen

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