

## Metallic Bipolar plate Manufacturing

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Borit developed the technology to produce metallic bipolar plates, which is next to the MEA, one of the basic components of a fuel cell. Borit offers a one-stop-shop solution by combining co-engineering in a direct interaction with the customer with a cost efficient and high quality manufacturing chain.

Metallic bipolar plates are a low cost alternative for the graphite plates, required to achieve the fuel cell cost targets set by fuel cell manufacturers. Typical material thickness for bipolar plates is 0.075 up to 0.25 mm.

Borit starts producing the bipolar plates from a standard coil of metal (mainly stainless steel types).

- Based on the customers drawings, Borit designs dedicated tools for forming, cutting, welding and leak testing of the bipolar plates.
- The metal is fed from the coil into the Borit Hydrogate press <sup>[1]</sup> and positioned under the forming die. The 2 halves of the bipolar plate are then formed using hydraulic pressure (up to 2000 bar), washed, dried, cut in sheets.
- In a next step, the sheets containing the plate halves are pre-cut.
- The 2 half plates are welded together using a fiber laser source. This is a very critical production step, since the welded bipolar plates must be leak tight.
- The plates are also laser marked with an individual number.
- After welding, the bipolar plates are 100% tested for leaks; 3 channels have to be tested : air, fuel and cooling channel.
- In a next step, the plates are cleaned and coated
- Optionally seals are applied to the bipolar plates before shipment to the customers for stack assembly



Figure 1: Hydrogate press line.

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### REFERENCES

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