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BIPOLAR FOILS

a new generation of fuel cells and redox flow batteries

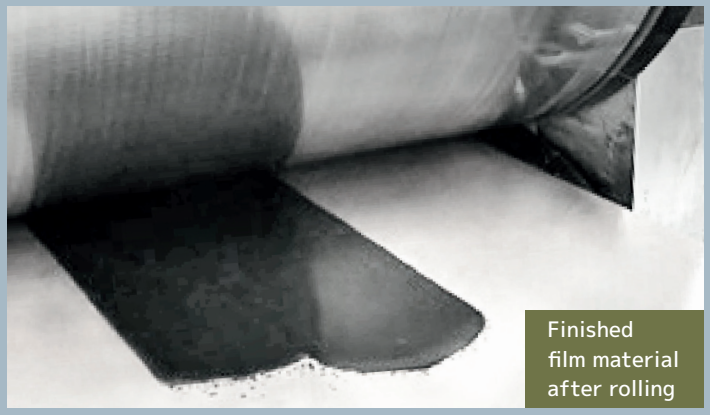
Breaking boundries

Used in fuel cells and redox flow batteries, bipolar foils are one of the most important components alongside the membrane unit. In the fuel cell, they absorb the electric current generated by the reaction of hydrogen and oxygen and pass it on to the energy consumer. In a redox flow battery, they do this with the liquids.

In order to achieve good electrical conductivity and to ensure that the hydrogen atoms do not penetrate the plates until they reach the reaction site, a carbon or graphite filling level of approx. 80 % must be achieved in the material.

This results in a material thickness of 0.6 to 1.5 mm approx. for conventional plates and a brittle property and sensitivity to mechanical influences.

Compound material



Finished film material after rolling

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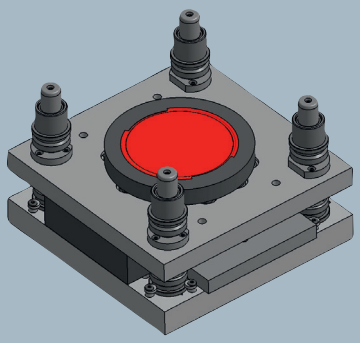
A quantum leap for the redox flow battery and fuel cell

A specially developed recipe by Eisenhuth now makes it possible to produce electrically conductive thin foils. The new recipe paired with the right manufacturing process makes it possible to produce foil material with a thickness of 0.5 to 0.7 mm, which, despite the high filling ratio of 80 % graphite or carbon, it remains elastic. Impermeability is also guaranteed despite the low material thickness.

Another advantage is the provision of the film on a roll. Due to its high flexibility, the material can be further processed very easily as thin bipolar plates for fuel cells and redox flow batteries using punching and bending technology. This makes it possible to realise an economic application, which is currently attracting a great deal of interest, especially in the automotive industry, specillcally in the area of commercial vehicle construction.

Punching tool in detail view



Punching tool for bipolar plate production

Thanks to its elasticity, the film can be provided on a roll

All advantages at a glance

- High electrical conductivity due to a Material density of 80 % conductive material
- Size reduction and weight saving for the entire fuel cell thanks to a thin material thickness of the graphite foil of approx. 0.5 – 0.7 mm
- Acceleration of the production process through Direct take-off of the film material from the roll
- Ensuring permanent corrosion resistance
- Effective reduction of material and production costs

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