Fraunhofer
UMSICHT

Material and component development for electrolysis processes

Seal-free and compact stack design

Next generation electrolysis design

Producing green hydrogen economically

Fraunhofer UMSICHT is working on a completely new stack design to enable the serial production of electrolysis stacks. The focus is on a carbon-containing composite bipolar plate, which can be bonded to adjacent components using laser transmission welding and thermal methods. This seal-free and compact stack design is characterized by material savings and reduces the number of individual components.

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Interested? Scan the QR code and learn more about our work!

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Material and component development for electrolysis processes

Electrolyzers for sustainable organic conversions

Futures solutions for sustainable organic synthesis now available

From catalyst development to reactor construction

Fraunhofer UMSICHT pioneers the development of electrolyzers designed for the reductive and oxidative conversion of organic molecules – ranging from fine chemicals to bulk chemicals. Our technology ensures unparalleled sustainability by avoiding stoichiometric waste products and offering broad scalability along with continuous operation. These features enable seamless integration into existing process chains, revolutionizing the field of organic synthesis with innovative and eco-friendly electrolysis solutions.

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Material and component development for electrolysis processes

High-pressure CO_2 electrolyzer

Groundbreaking CO_2 electrolysis technology

Improving carbon and energy efficiency

Our high-pressure electrolyser can convert CO_2 to CO at pressures up to 120 bar using membrane electrode assemblies. A high cathode pressure allows direct coupling with downstream product separation and subsequent chemical processes without additional compression steps. This improves carbon and energy efficiency and doubles the productivity for CO_2 conversion compared to the current state of the art.

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