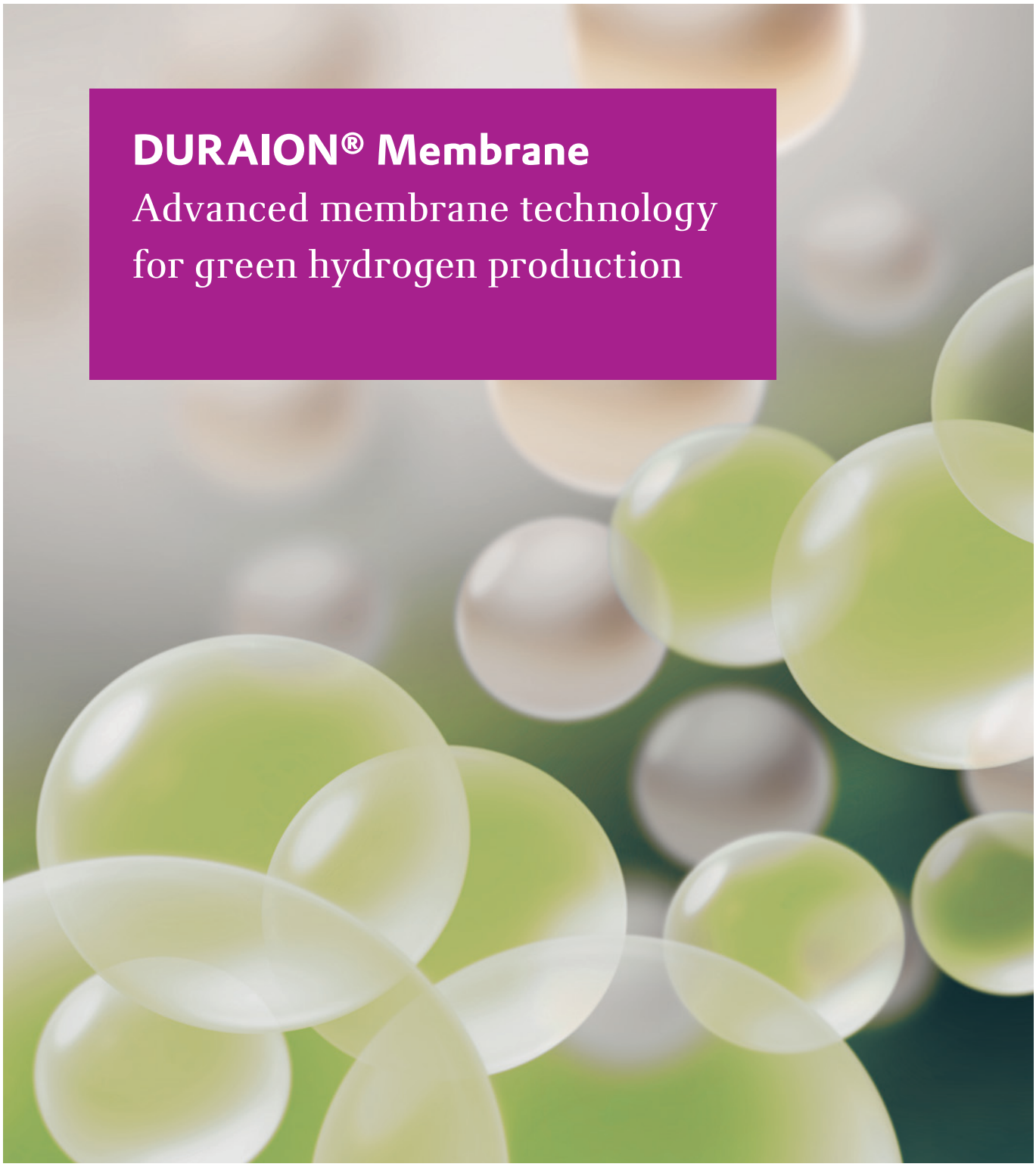


DURAION® Membrane

Advanced membrane technology for green hydrogen production

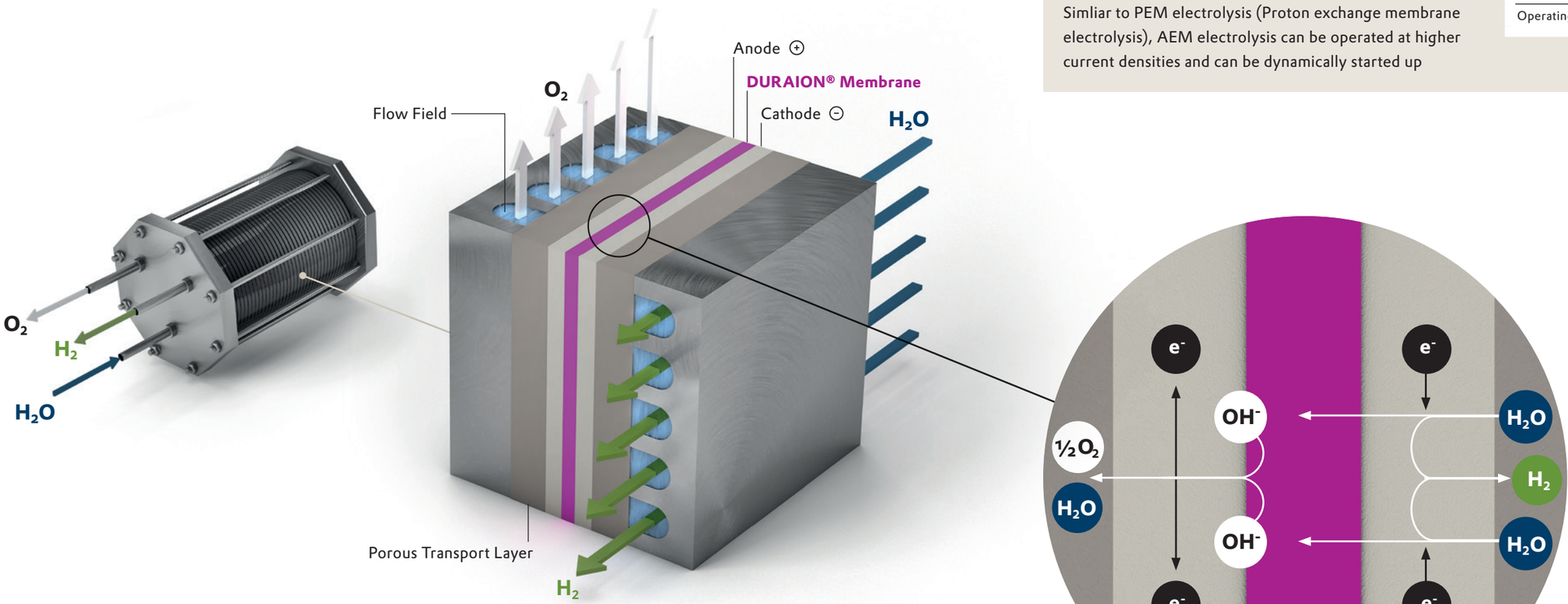
EVONIK
Leading Beyond Chemistry

DURAION® – AEM ELECTROLYSIS FOR GREEN HYDROGEN PRODUCTION

We are meeting the global challenge of the energy transition with our commitment and our solutions in the field of the green hydrogen economy.

The current high price of green hydrogen prevents its widespread production and use. At Creavis, researchers have developed the novel anion exchange membrane DURAION® which is the key component for the alkaline exchange membrane water electrolysis technology (AEM electrolysis).

The DURAION® Membrane aims to make the competitive production of green hydrogen possible and allows the partners of Evonik to lead the way into a sustainable hydrogen economy.



The DURAION® Membrane is the center piece in the electrolyzer with its ability to conduct anions. It separates the two reaction chambers and enables thereby the continous production of hydrogen in the electrolysis cell. Multiple electrolysis cells are combined to a stack to increase the amount of hydrogen produced.

AEM electrolysis – The best of two worlds

By integrating DURAION® Membrane into an AEM electrolyzer, the investment and operating costs can be siginficantly reduced compared to today's benchmark technologies (AEL and PEM electrolysis).

Since the operation of AEM electrolysis takes place under alkaline conditions like in AEL (alkaline electrolysis), noble-metal-free catalysts for the electrodes and inexpensive materials for the cell design can be used. Simliar to PEM electrolysis (Proton exchange membrane electrolysis), AEM electrolysis can be operated at higher current densities and can be dynamically started up providing a high degree of flexibility. It thus combines the advantages of the benchmark technologies without their drawbacks.

	Alkaline electrolysis	PEM electrolysis	AEM electrolysis
Flexibility	○	●	●
H_2-pressure	○	●	●
Investment cost	●	○	●
Operating cost	○	●	●

DURAION® Membrane – Our performance promise

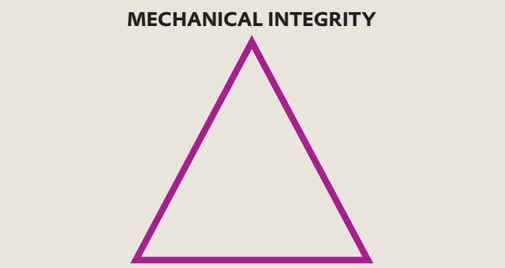


Figure: Membrane quality triangle

The DURAION® Membrane of Evonik meets the quality triangle of membrane-based water electrolysis by balancing the required properties without favoring one over another.

- Very high ionic conductivity
- Excellent chemical stability in aggressive media
- Distinguished mechanical integrity

The polymer expertise of Evonik has been the key in developing DURAION® Membrane for AEM electrolysis and makes us unique among the developers of anion exchange membranes.

Evonik supports its partners and customers by the integration of DURAION® Membrane into the electrolyzer. We guarantee scalable and customizable solutions based on our pronounced and backward-integrated monomer and polymer expertise.

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