

TECH FACT SHEET

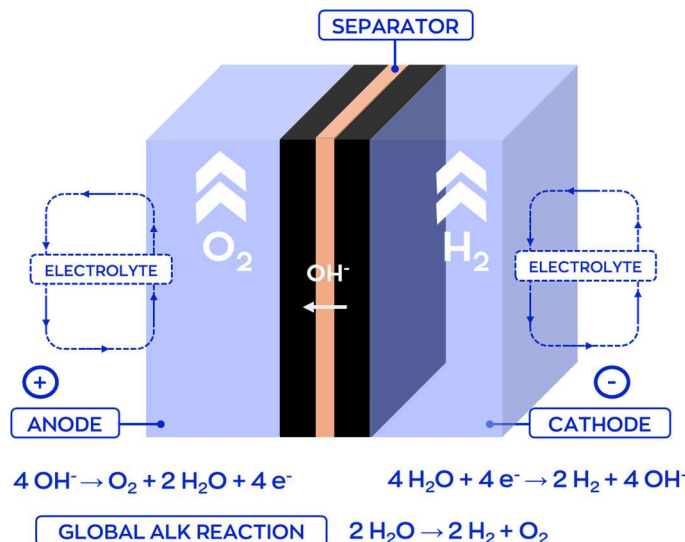
ALK Electrolysis



Alkaline (ALK) electrolysis is the most industrially established hydrogen production technology, with decades of operational data at large scale.

ALK ELX is based on alkaline chemistry using liquid electrolyte (NaOH or KOH) with a porous separator (diaphragm):

- To allow ion (OH⁻) transport between cathode and anode compartments
- To act as a physical separator between the cathode and the anode



TRL 9 - Full Commercial



ALK electrolysis has been deployed industrially for decades, with systems operating reliably at MW-to-GW scale

Current development focus:

Modernisation of stack design, improved separator materials and dynamic operation

Active Players in Market

ALK ELX Systems

- ThyssenKrupp Nucera (Germany)
- Nel Hydrogen (Norway)
- Peric (China)...

ALK Materials

- Agfa
- Toray Industries
- KOH/NaOH suppliers...

Adoption Barriers

1. Liquid electrolyte handling and highly corrosive media adds complexity to BoP
2. Limited safety range of operation (gas crossover)
3. Lower current density than PEM
4. **Limited dynamic operation capability**

≈ 55,54 kWh/kg

ELX Stack Level

*average value from multiple stacks

99.5 - 99.9%

H₂ Purity

*possible to improve with purification equipment

80,000 to 100,000 h

Demonstrated system

Best suited for

- Large-scale baseload hydrogen production (MW to GW)
- Projects where CAPEX minimisation is the primary driver
- Regions with established industrial chemical handling infrastructure

Not recommended for

- Highly dynamic or intermittent renewable energy coupling is required
- Project site has strict footprint or space constraints
- Rapid start/stop cycling is a core operational requirement
- Ultra-high H₂ purity is required without additional purification investment

Let's tick the boxes

together

- I know which ALK suppliers offer the best stack lifetime warranties
- I have assessed whether ALK's larger system footprint is acceptable

- I have compared ALK vs PEM total cost of ownership over the full project lifetime

Ready to evaluate ALK ELX for your project?

Fado Energy provides independent technology assessment, supplier benchmarking and procurement advisory — tailored to your application.

[Talk to our team](#)