



Reliable high-performance  
membranes for alkaline  
water electrolyzers.

For a radically greener world.

**ZIRFON™**

# Why you need a ZIRFON™ membrane inside your electrolyzer

While a membrane is just a small component of an alkaline electrolyzer, ZIRFON, Agfa's membrane, has a transformative impact on the overall system performance. Through its assembled characteristics, ZIRFON guarantees peak performance at the lowest hydrogen production cost.



## Lowest energy consumption, highest yield

ZIRFON enables alkaline electrolyzers to produce up to 6 times more hydrogen than traditional PPS membranes, delivering unmatched efficiency and performance.



## Ideal for coupling with renewable energy

ZIRFON allows alkaline electrolyzers to maintain high efficiency at low power loads and enable ultra-fast ramping up and down, making them an ideal choice for integration with renewable energy sources.



## Guaranteed safe operations

ZIRFON enables consistent high-purity hydrogen and oxygen production, enhancing safety even at low loads.



## Proven technology, available at scale

ZIRFON has delivered proven, reliable performance with over 10-year lifespans, making them a trusted choice for global electrolyzer manufacturers. We are expanding our production capacity to support 20 GW per year.

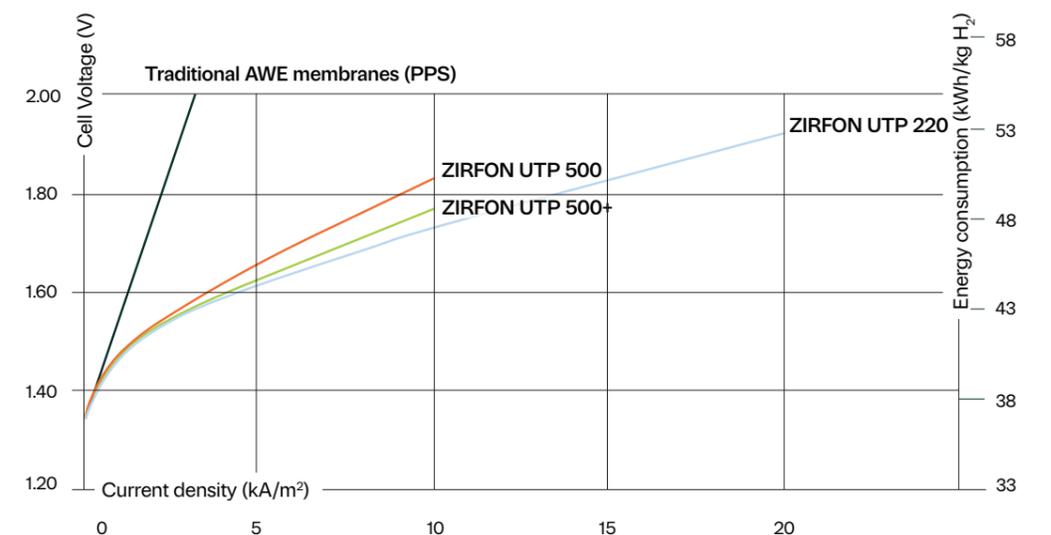


## Lowest energy consumption, highest yield

With unparalleled ionic conductivity and optimized bubble management, ZIRFON membranes enable alkaline water electrolyzers to operate at high current density and low cell voltage.

This translates in electrolyzer plants with the lowest energy consumption per kilogram of hydrogen produced. Alkaline water electrolyzers equipped with ZIRFON can produce up to 6 times more hydrogen per active area compared to traditional PPS membranes.

## Super-efficient ZIRFON membranes let electrolyzers achieve the highest performance



*The low resistance of ZIRFON allows low cell voltage, even at high current density. ZIRFON stands out through lower energy consumption per kg of hydrogen produced.*





## Ideal for coupling with renewable energy

Alkaline water electrolyzers with ZIRFON membranes can operate at a power load as low as 10% while maintaining high performance and reliability. In addition, their ultrafast up and down ramp rate of 1% per second lets them respond quickly to sudden power fluctuations.

These capabilities maximize uptime and ensure seamless integration with intermittent renewable energy sources like wind and solar. By avoiding shutdowns during periods of low power availability, ZIRFON also extends the lifespan of the electrodes.

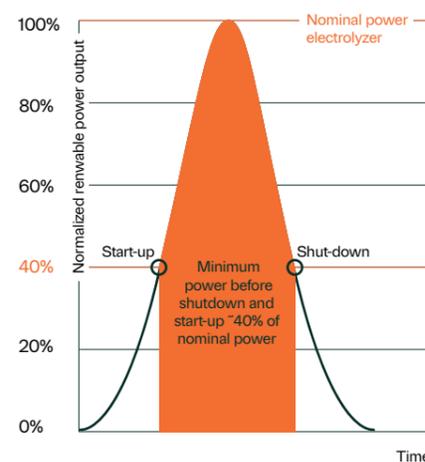
In contrast, electrolyzers with alternative diaphragms have a much narrower operating range, limiting their flexibility.

“European alkaline electrolyzers are adopting advanced composite membranes. The most popular product is Agfa’s ZIRFON. It offers better electrical conductivity and greater critical pressure above which undesired gas mixing occurs.”

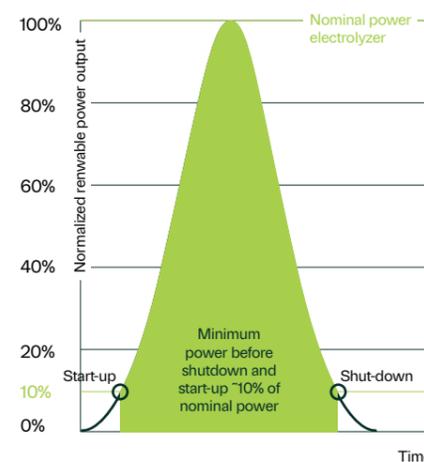
BloombergNEF

## Maximized electrolyzer uptime

Traditional AWE with PPS separator



Advanced AWE with ZIRFON



*Reduced gas crossover increases electrolyzer operational uptime, converting more renewable energy (such as solar) to hydrogen.*



## Guaranteed safe operations

ZIRFON membranes enable alkaline water electrolyzers to consistently produce high-purity hydrogen and oxygen, even at low power loads. This exceptional performance is made possible by their innovative design, which combines a porous layer to ensure excellent conductivity with a dense surface that effectively minimizes gas crossover, guaranteeing safe operations.

In comparison, electrolyzers using alternative diaphragms typically operate with gas purities closer to the lower explosion limit (LEL) – compromising safety.





## Proven technology, available at scale

ZIRFON membranes have consistently delivered proven performance since their introduction in 2007, with demonstrated life spans of over 10 years. Backed by our extensive expertise and large-scale production capacity, ZIRFON is reliably available, offering dependable quality and lasting performance.



## Trusted worldwide to power over 3GW of electrolyzers

Top alkaline water electrolyzer manufacturers worldwide trust ZIRFON for its efficiency, reliability, and cost-effectiveness in producing green hydrogen. This widespread confidence reinforces ZIRFON's role as a key enabler of sustainable hydrogen production.

## Robust production capacity

To meet the increasing demand for sustainable and efficient hydrogen production, we are expanding ZIRFON production at our facility in Belgium. Backed up by a €11 million grant from the EU Innovation Fund, the GIGA-SCALES project will scale up the plant's capacity to support up to 20 gigawatts of alkaline water electrolysis annually, positioning it as the largest alkaline membrane production facility.



## Continuous innovation

As the market leader in membranes for alkaline water electrolysis, we are constantly innovating to enhance our ZIRFON portfolio, ensuring we remain the benchmark for performance, cost-efficiency, and reliability in the evolving hydrogen economy. Collaborations with leading electrolyzer manufacturers and renowned research institutions strengthen our technology, drive global adoption, and align our solutions with future industry needs.

The innovation behind ZIRFON has been recognized and safeguarded through patent protection, solidifying its exclusivity, and cementing its position as the industry leader in membranes for alkaline water electrolysis technology.



What we offer

# Product portfolio

ZIRFON UTP 500

ZIRFON UTP 500+

ZIRFON UTP 220

The ZIRFON UTP500/500+ membranes stand out through their exceptional ionic conductivity and optimized bubble management, enabling alkaline water electrolyzers to operate efficiently even at lower current densities. The thinner ZIRFON UTP220 is designed for higher current densities while maintaining lower cell voltage, reducing energy consumption per kilogram of hydrogen produced.

ZIRFON membranes come in sizes up to 1.75 meters (68.9 inches) wide and are pre-humidified, so they're ready to use right away.

Technical data sheets with detailed specifications of the different ZIRFON products can be found on [agfa.com/zirfon](https://www.agfa.com/zirfon).

Vision

## Proud to be powering the green hydrogen revolution

We are excited to drive the efficiency and affordability of green hydrogen production through our innovative membranes for industrial applications. By empowering other leaders in the value chain to succeed, we aim to accelerate success in the green hydrogen economy. Together, we are committed to reducing carbon emissions and making clean energy a reality for millions in a radically greener world!

Practical info

## Another great brand of Agfa

ZIRFON is a brand of Agfa, a leading multinational company in imaging technology and IT solutions with over 150 years of experience. The group holds three divisions: Digital Print & Chemicals, Radiology Solutions, and HealthCare IT. In 2023, it realized a turnover of 1,150 million Euro.

More info at [www.agfa.com/zirfon](https://www.agfa.com/zirfon)  
Contact us via [infozirfon@agfa.com](mailto:infozirfon@agfa.com)

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