Stiesdal®
Hydrogen

The HydroGen Electrolyzer

The HydroGen Electrolyzer is an industrialized unit for pressurized hydrogen production at low cost. The HydroGen technology represents a lean integrated product design of previously unattainable simplicity.

Designed for industrialized mass production
The HydroGen technology is based on a rethinking of traditional hydrogen electrolyzers, transitioning from a chemical industry design approach to a renewables design approach.

This design approach has resulted in a suite of unique features:

- A modular system arrangement designed for mass production by established industrial partners and suppliers with a global footprint.
- A self-contained system suitable for easy transportation and outdoor installation, requiring no buildings.
- Minimal Balance-of-Plant requirements with plug-and-play unit installation.
- A unique pressure vessel concept enabling high hydrogen delivery pressure without additional compression.
- Dynamic operation capability, allowing the system to follow volatile electricity spot prices, or a wind and solar PV output.

Through its industrialized design, ease of installation, and operational flexibility, the HydroGen Electrolyzer is at the forefront of advancing true low-cost green hydrogen production.

HydroGen's dynamic range performance
The green hydrogen of the future should be produced with wind and solar, hence the need for a system that can be a flexible consumer of electricity. HydroGen's active frontend is prepared for a future where hydrogen production plays a significant role on the demand side of electricity markets.

Low-cost green hydrogen has arrived

At Stiesdal Hydrogen, we have taken up the challenge to accelerate the development of affordable green hydrogen.

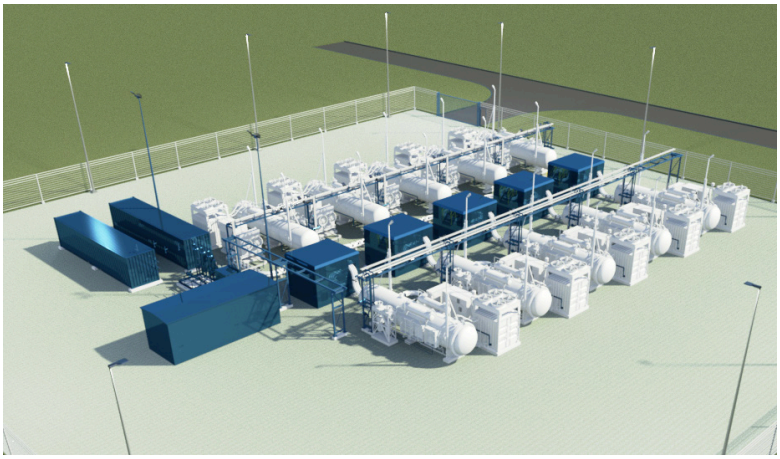
Green hydrogen is a key ingredient in the decarbonization of the world's energy supply. To provide the hydrogen volumes required for fossil fuel substitution, green hydrogen production capabilities will need to speed up dramatically.

Industrialized electrolysis
The HydroGen Electrolyzer delivers on the two essential factors that will ensure the required ramp-up in scale for green hydrogen:

- **Industrialized design:** By standardizing and modularizing the electrolyzer units, we enable rapid scale-up of manufacturing based on existing supply chains.

- **Industrialized implementation:** By standardizing and modularizing also the Balance of Plant required for a complete hydrogen production arrangement, we enable rapid deployment across diverse locations.

Read more at
www.stiesdal.com



Next generation hydrogen plant

Full system industrialization

The HydroGen Electrolyzer is designed to become an integral part of next generation Power-to-X facilities. This includes a full system industrialization approach where not just the unit itself but also the installation process and balance of plant is highly industrialized.

Supply chain centered design strategy

Stiesdal Hydrogen has opted for a supply chain-centered design strategy of the electrolyzer, where the system's main components are adapted to the mass production methodologies applied by established industrial partners with a global footprint. The main components are standardized and modularized in a manner similar to that applied by other large-volume industrial products, e.g., as applied in the truck manufacturing sector.

Why alkaline

The alkaline electrolyzer technology uses electrodes made with abundant elements and does not require the noble metal catalysts required for other electrolysis technologies. It operates at low temperature, ensuring a long system lifetime. The relative simplicity of alkaline electrolysis is highly compatible with mass production and use of standard industrial technologies.

Technical specifications of the HydroGen Electrolyzer

Rated power	3100 kW
Delivery pressure	Ambient to 35 bar
Net pure Hydrogen at nominal load	Up to 57.5 kg H_2 per hour
Hydrogen purity at nominal load	Higher than 99,2% (wet basis)
Guaranteed efficiency, system (AC)	75% at loads from 25%-80%
	73% at loads from 80%-100%
Start-up time	Under 5 minutes
Dynamic range	25-100%
Dynamic ramp-up rate	1% load per second

Plug & play installation

The HydroGen Electrolyzer is from the outset designed for plug & play installation.

The entire electrolyzer system can be supplied on two trucks, one delivering the electrolyzer unit itself, the other delivering the power supply and the auxiliary systems.

Once delivered to site, the installation process of the unit is limited to mounting of the modules on pre-installed point foundations, and mechanical and electrical completion at well-defined interfaces.

The Balance of Plant is reduced to a minimum, with no requirements for buildings or large support systems. The units are individually cooled, while water supply, gas post-processing and MV switchgear are normally implemented in simple and standardized, centralized units.

Read more at
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QUALITY SYSTEM CERTIFICATION DNV ISO 9001

SAFETY SYSTEM CERTIFICATION DNV ISO 45001