

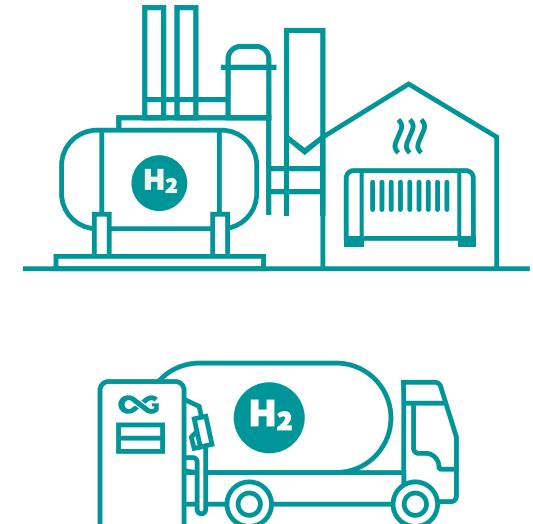
# HYDRO $\infty$ GENERA

Unlocking the potential of H<sub>2</sub>

# HYDROGENERA

We are pioneers in developing hydrogen technologies. We're at the forefront of driving change from our advanced electrolyzers, known for their reliability and energy efficiency, to our solid-state hydrogen storage containers based on AB5 metal hydride alloys.

Our focus extends across the entire hydrogen value chain, encompassing production, storage, distribution, and final use, enabling us to contribute to decarbonizing diverse sectors, including heavy industry, transport, and energy.



HYDROGEN GLOBAL

First Bulgarian company  
to join the European Clean  
Hydrogen Alliance

As a member of the Hydrogen  
Global Initiative, we collaborate  
with global partners to accel-  
erate the adoption of hydrogen  
solutions

WORLD  
ENERGY  
COUNCIL

Author of eleven projects  
for green energy, each  
listed and prioritized on  
the European hydrogen  
map

Hydrogen  
Europe

As an active member, we help  
shape the policies and projects  
driving Europe's clean energy  
transition.



BULGARIAN  
STOCK EXCHANGE

A publicly listed company on  
the Bulgarian Stock  
Exchange, offering a  
direct investment path into  
the future of green hydrogen.

# Team



## Dragomir Ivanov

*Founder/CEO*

Inventor of utility model for Atmospheric Alkaline Electrolyser.  
Inventor of a controlling system, managing the production of hydrogen and oxygen by pulsed water electrolysis method.  
Over 15 years of experience in developing and integrating innovative products for the different operations of the hydrogen value chain.



## Borislav Borisov

*Chief Production Engineer*

Engineer with over 10 years of experience in development, production, integration and installation of hydrogen facilities. Completed prototypes for electrochemical compressor for hydrogen, hydrogen internal combustion engine, control system of a hydrogen production process by pulsed water electrolysis method.



## Dimiter Banov

*CFO*

Over 17 years of experience in finance management and investment banking. Proven track record of generating value for companies at different stages of development - from start-ups to market leading listed companies.

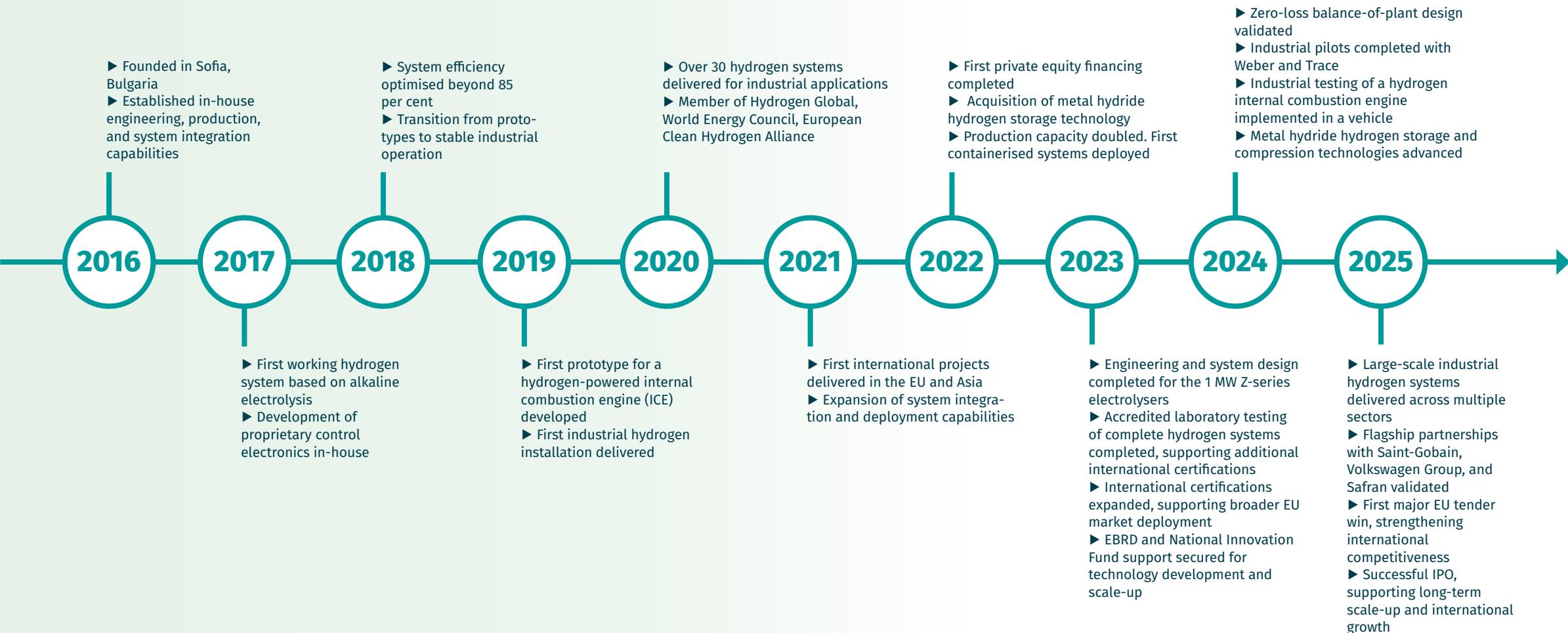


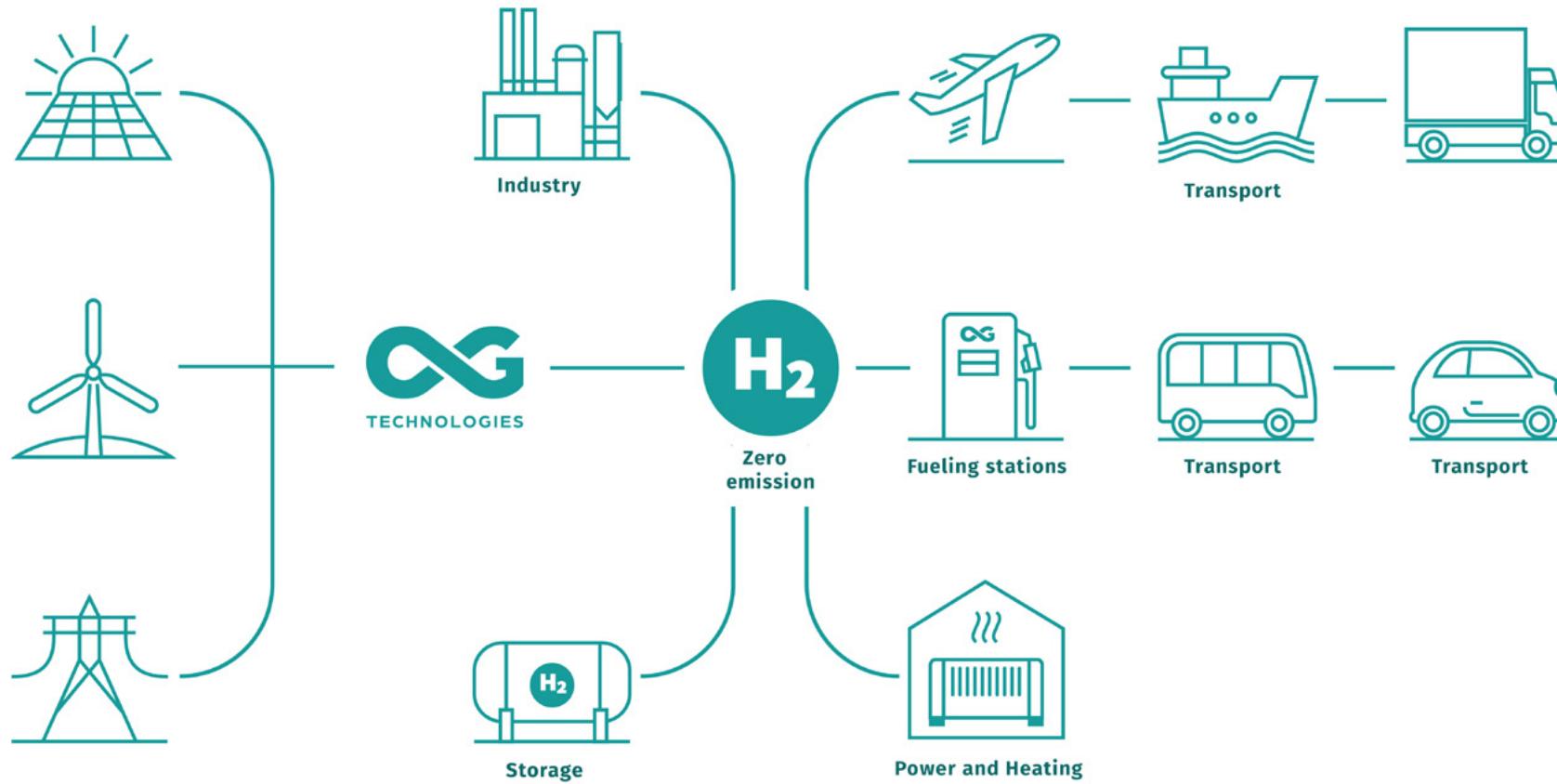
## Angel Kasabov

*Chief Electronics Engineer*

Over 30 years experience in designing, programming and integrating industrial controllers. Senior Assembly language programmer for single-chip microprocessors.

# Timeline





## We are pioneers in developing hydrogen technologies.

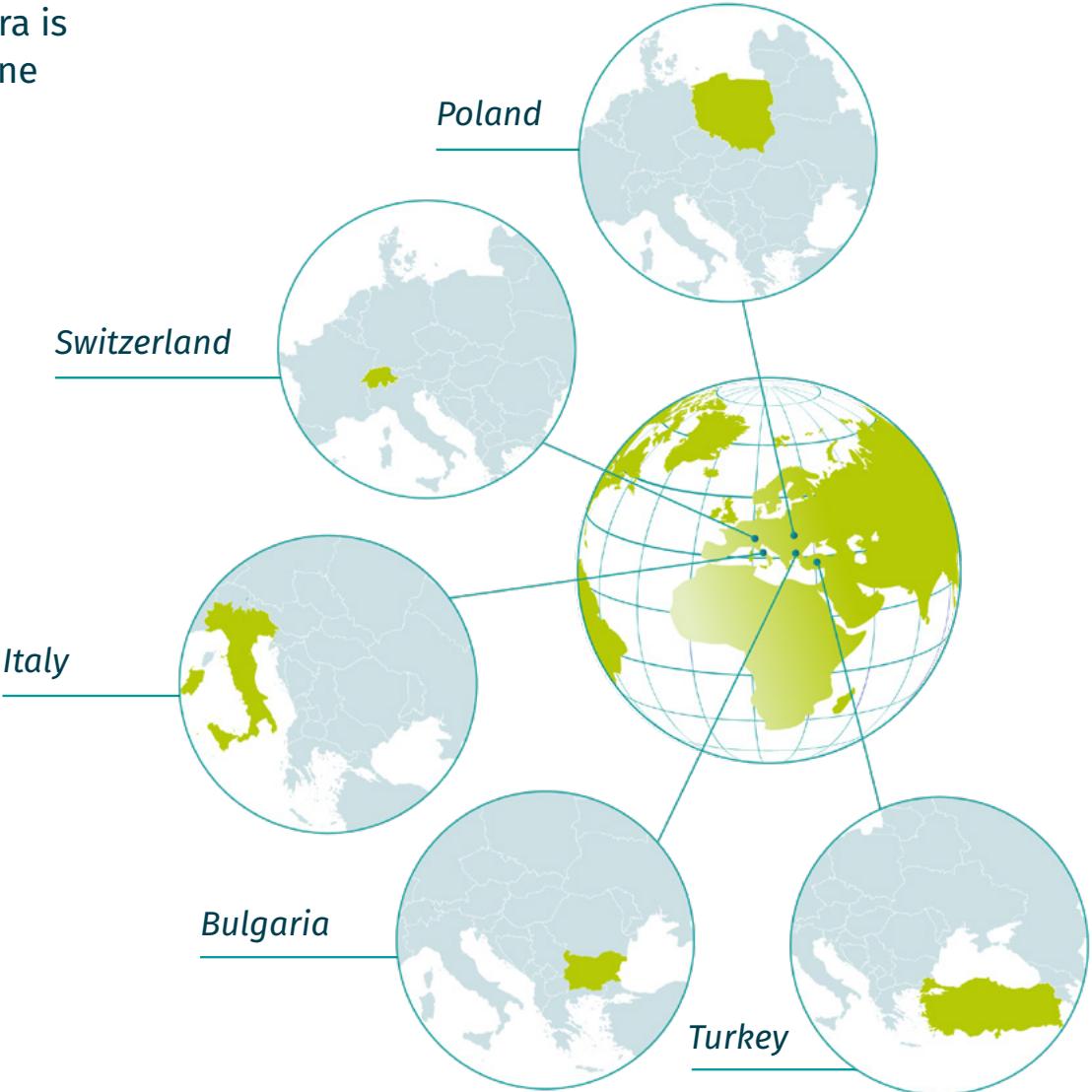
Our focus extends across the entire hydrogen value chain, encompassing production, storage, distribution, and final use, enabling us to contribute to decarbonizing diverse sectors, including heavy industry, transport, and energy.

With more than 100 projects for hydrogen systems, Hydrogenera is a recognized leader in the production and integration of alkaline electrolyzers in Eastern and Central Europe

*Key customers:*



**3**  
Years  
**100+**  
Projects  
**5**  
Countries



## Alkaline Electrolyser - E Series

### *Tailored, Modular Energy Solutions*

The hydrogen systems from the E series are customized solutions, tailored to meet the specific energy needs of each business. These modular systems produce clean, high-energy fuel (hydrogen and oxygen) on-site and integrate it into any combustion process of conventional fuels, achieving increased energy efficiency.



# Key Features:

- 🕒 **Customisation and Flexibility:** Each E system is tailored to meet the unique requirements of different businesses, ensuring optimal integration and performance.
- 🕒 **Modular Design:** The system's modular concept allows for scalability, enabling businesses to adjust its size based on their energy needs and expansion plans.
- 🕒 **On-Site Production:** E systems produce hydrogen and oxygen on-site, reducing the need to transport and store these gases.
- 🕒 **Immediate Utilization:** The produced hydrogen can be immediately added to existing combustion processes, enhancing energy efficiency.
- 🕒 **Increased Energy Efficiency:** When hydrogen and oxygen are blended with conventional fuels, E systems can achieve up to a 30% relative increase in energy efficiency.
- 🕒 **Reduced Emissions:** E systems help reduce harmful emissions by adding hydrogen into combustion processes.
- 🕒 **Sustainable Energy:** Utilizing hydrogen as a fuel supports the transition to sustainable energy sources, aligning with global environmental goals.

## Applications :



Industry



Power and Heating



Agriculture



Greenhouses

# Integration of E Series Electrolyser in Trace



# Integration of E Series Electrolyser in Weber



For further information see the link below:

[Saint Gobain Letter of Recommendation](#) | [Independent Lab Analysis](#)

# Integration of E Series Electrolyser in Polish Academy of Science



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For further information see the link below:

[Project Description](#) | [Independent Lab Analysis](#)

## Alkaline Electrolyser - Z Series

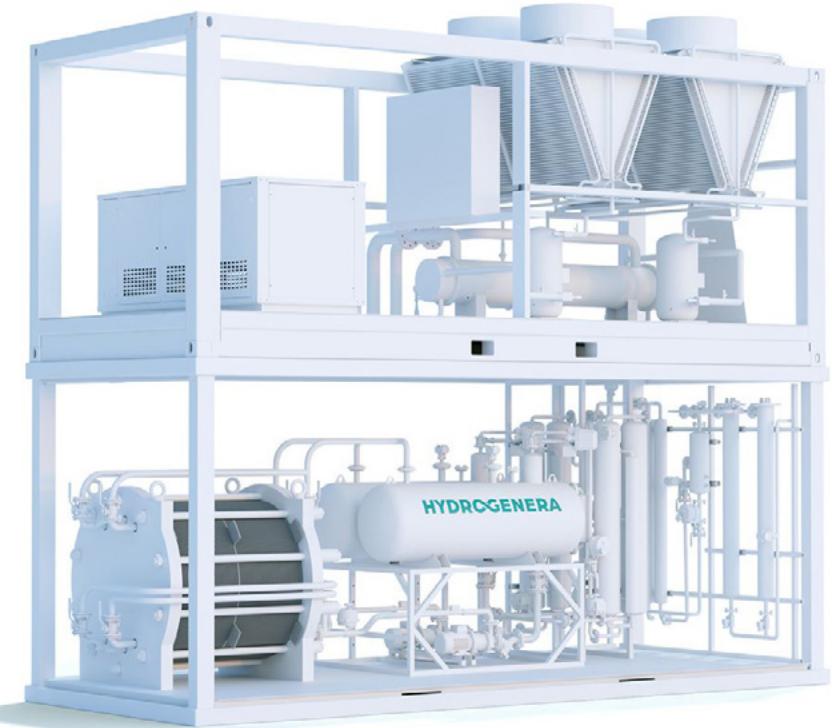
### *Modular turn-key Hydrogen Solutions*

Our alkaline electrolyzers make a superior choice for Industry, Transport and Power-to-X applications. Modular, scalable, turn-key product ranges set to meet any customer requirements. Z hydrogen systems offer a cutting-edge solution for efficiently, safely, and reliably producing high-purity hydrogen.

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**1 MW ▶ 200 Nm<sup>3</sup>/h ▶ 432 kg/24 h**

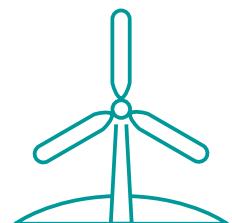
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# Key Features:

- ✓ **High Efficiency:** Featuring a cell stack power consumption as low as 55,5 kWh/kg H<sub>2</sub>. The Z 1 MW systems produce 200 Nm<sup>3</sup>/h of hydrogen or 432 kg per day.
- ✓ **Hydrogen purity:** up to 99,999%
- ✓ **Custom Solutions:** Tailored BOP and stack designs for specific project needs
- ✓ **Durability:** The stack's lifespan is up to 15 years, ensuring reliability and reducing maintenance costs
- ✓ **Dynamic Response:** Quick adaptation to variable power demands from renewable energy sources
- ✓ **Versatile Applications:** Suitable for Industry, Transport and Power-to-X applications
- ✓ **Turnkey Systems:** Comprehensive, ready-to-use solutions
- ✓ **Scalability:** Easily expandable to meet growing hydrogen production needs
- ✓ **Compact Design:** Space-efficient modular system

## Applications :



RES



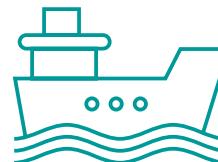
Fueling Station



Power and Heating



Storage



Heavy Duty Transport



Industry

## Photo Gallery - 0,5 MW



## Metal Hydride-Based Hydrogen Storage Solutions

Metal hydride containers store hydrogen by absorbing it into the crystal structure of metal alloys, allowing efficient storage at low pressure and near room temperature. This method presents a safer alternative to high-pressure gas or cryogenic liquid storage. Using solid-state hydrogen storage metal hydride containers reduces the risks of leaks and other hazards. These storage systems are ideal for applications where safety and space efficiency are critical.

Additionally, metal hydrides provide higher volumetric hydrogen storage densities than compressed or liquid hydrogen, making them suitable for various industrial and marine applications.



## Key Solutions We Offer:

**Small Demonstrative Canisters:** These have capacities ranging from 10 to 1000 NL and are designed for use in FID analysers, educational systems and hydrogen-powered RC cars.

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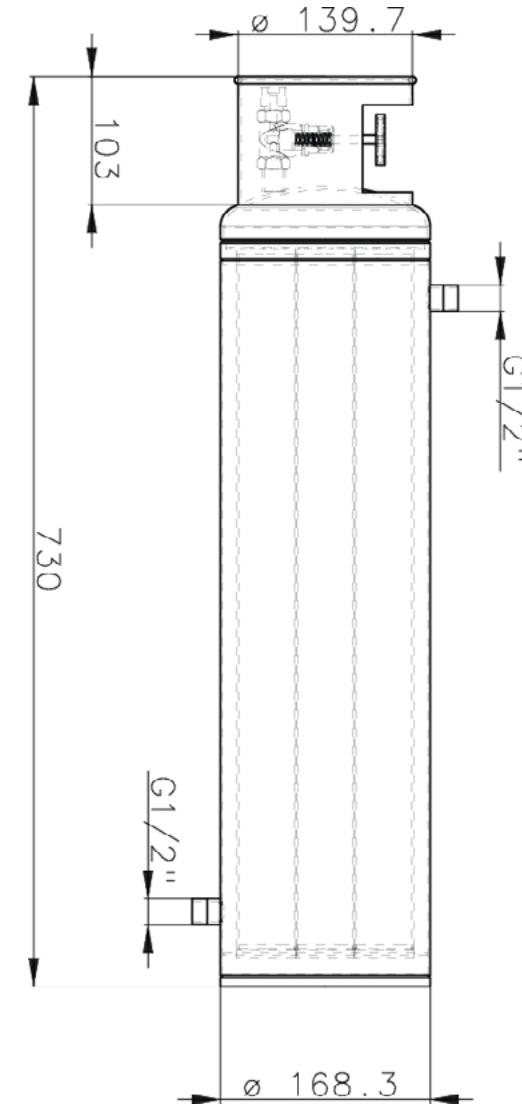
**Larger Hydrogen Storage Containers:** Capacities from 1 to 150 kg are available for stationary and marine applications. These containers are flexible and modular, allowing customisation based on specific capacity needs. Their design makes them ideal for specialised applications where space and weight are key considerations.

# Technical Data Sheet Metal hydride storage tank

## model GSH3000

Nominal Hydrogen Storage Capacity	3000 Normal liters
Charging Pressure	15 barg
Charging Temperature	$\leq 20^{\circ}\text{C}$
Nominal Hydrogen Charging Rate	50 l/min
Hydrogen Purity at Tank Inlet	$\geq 99.995\text{ %vol}$
Oxygen Content In Hydrogen At Tank Inlet	< 5 ppm
Nominal Hydrogen Discharging Rate <sup>1</sup>	50 l/min
Hydrogen Delivery Pressure	From 15 to 2 bar
Cooling Water Temperature	$\leq 20^{\circ}\text{C}$
Fluid Temperature For The Tank Heating	30-50 $^{\circ}\text{C}$
Cycling Capability	> 1000 cycles
Body Material	EN 1.4301 (AISI 304)
Internal Filter	Swagelok 2 $\mu\text{m}$
Heat Exchanger	Internal
Hydrogen Connection	Stainless steel valve
Hydride Material	AB5-type metal hydride, LaNi5 based
Outside Diameter	169 mm
Overall Length	755 mm
Weight	40 kg

<sup>1) Rated parameters are valid using the heating/cooling circuit with internal heat exchanger.</sup>



# Integrators



## Germany **Hydro Future GmbH**

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+90 533 697 74 06  
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## UK **Hydrogenify**

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[biuro@nabla-pe.pl](mailto:biuro@nabla-pe.pl)

## R&D

*Since our founding, sustained R&D efforts have contributed to the continual improvement of our technology, setting the benchmark in the market*



### **Metal Hydride high pressure compressor /up to 750 bar/ based on AB5 and AB2 metal hydride alloys.**

By utilizing waste heat generated in hydrogen production, the metal hydride compressor helps increase the overall efficiency of the hydrogen systems. It reduces the reliance on energy-consuming electrical compression, while simultaneously decreasing the energy required for cooling. This approach not only improves energy efficiency but also significantly lowers operational costs.



### **Internal Combustion Engine Running on H2**

The principle of operation is identical to the traditional gasoline engine. Hydrogen fuel means zero CO2 emissions for transport industry.

## Contacts:

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