



DASH C-SERIES

SOLID-STATE HYDROGEN
STORAGE MODULES

PLUG-AND-PLAY

SAFE

HIGH-CAPACITY

POWERING THE FUTURE
OF HYDROGEN STORAGE



APPLICATION #1

The DASH C-Series hydrogen storage systems are designed to ensure continuous hydrogen access to industrial customer thanks to its modular, scalable, and low-maintenance setup.



UNLOCK THE POWER OF SOLID-STATE HYDROGEN

The 'C' in our DASH C-Series stands for Containerized: a plug-and-play hydrogen storage system complete with all essential systems.

APPLICATION #1: STORAGE OF FLUCTUATING HYDROGEN PRODUCTION

As the shift towards green hydrogen production is advancing, hydrogen storage capabilities at production sites become crucial. This is the key enabler to a 100% green hydrogen production, decoupling the production profile with the needs from downstream users. The DASH C-Series bridges production and consumption needs.





PARAMETER	BASIC SOLUTION: COMPRESSED H ₂ (200 BAR)	GRZ SOLUTION: DASH C-SERIES H ₂ STORAGE
Storage Capacity	675 kg H ₂	675 kg H ₂
Pressure	High (200 bar)	Low (< 45 bar)
Safety Concept	High pressure increases risks, requiring costly safety measures	Superior safety through low-pressure, solid-state technology
Footprint ¹	> 100 m ²	15 m ²
Scalability	Limited by footprint and safety requirements	Modular and easily scalable
Maintenance	High maintenance due to compressors and frequent high-pressure testing	Minimal due to no moving parts and low pressure
Levelized Costs of Hydrogen Storage ²	0.69€/kg H ₂	0.38€/kg H ₂

¹ Considering a conventional trailer with a capacity of 225 kg H₂ and a length of 12.5 m; without considering the safety distance and other constraints.

² Considering a lifetime of 20 years, cost of capital 4%/y, costs of hydrogen compression of € 0.55/kg H₂, operation 365 days per year.

APPLICATION #2

APPLICATION #2: BUFFER STORAGE FOR INDUSTRIAL HYDROGEN CONSUMERS

The DASH C-Series solutions provide a safe, high-density supply of hydrogen, with typical applications including:

STEEL
MANUFACTURING

Enables decarbonization through hydrogen integration.

CHEMICAL
PROCESSES

Powers hydrogenation reactions with hydrogen.

INDUSTRIAL
FURNACES

Switches operations to carbon-free fuel options (e.g., green hydrogen).

GENERAL
INDUSTRIAL USE

Supports any on-site hydrogen-consuming process.

PARAMETER	BASIC SOLUTION: H ₂ TUBE TRAILERS (200 BAR)	GRZ SOLUTION: DASH C-SERIES H ₂ STORAGE
Storage Capacity	1350 kg H ₂	1350 kg H ₂
Safety Concept	Fire Detectors, Protection Walls and ATEX Zones Required	Simple Implementation
Footprint ¹	200 m ²	30 m ²
Levelized Costs of Hydrogen Storage ²	0.69€/kg H ₂	0.38€/kg H ₂

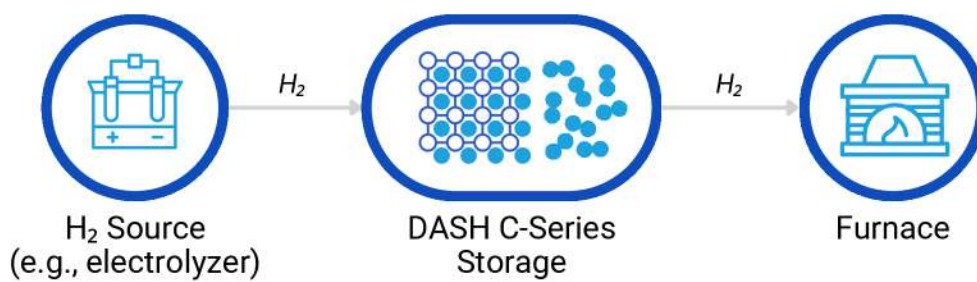
¹ Considering a conventional trailer with a capacity of 225 kg H₂ and a length of 12.5 m; without considering the safety distance and other constraints.

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APPLICATION #2



EXAMPLE APPLICATION FOR INDUSTRIAL FURNACES



CASE STUDY: GRUYÈRE HYDROGEN POWER

GHP'S ON-DEMAND INDUSTRIAL BUFFER STORAGE

Gruyère Hydrogen Power SA (GHP), based in Bulle, Switzerland, has launched a pioneering hydrogen production project powered by renewable energy, primarily biomass and solar. To enable safe, on-demand green hydrogen storage, GHP partnered with GRZ to integrate the DASH C-Series system, engineered for industrial and mobility applications.



KEY DETAILS

CLIENT	GHP (Gruyère Hydrogen Power SA)
LOCATION	Bulle, Switzerland
PROJECT TYPE	Industrial Hydrogen Buffer Storage
PRODUCT USED	DASH C-Series 200 kg H ₂

CHALLENGE

GHP required a hydrogen storage solution that would support its green energy goals, seamlessly integrate with existing infrastructure, and meet the demands of high-frequency industrial usage. Ensuring a safe, steady hydrogen supply, without extensive maintenance, was crucial for fueling a variety of industrial applications.

SOLUTION

GRZ delivered a tailored DASH C-Series system with 200 kg H₂ capacity, absorbing hydrogen directly from the electrolyzer to avoid high-pressure compressors. This compact, low-pressure solution reduces operational costs while supporting GHP's sustainable energy use, ensuring a safe and efficient hydrogen supply for various industrial applications.

BENEFITS

The DASH C-Series has provided GHP with a dependable, cost-efficient storage solution that optimizes renewable energy use, lowers operational costs by eliminating high-pressure compressors, and scales easily to meet expanding hydrogen demands.

KEY FEATURES

DASH hydrogen storage modules are patented, solid-state systems designed to provide a safe, efficient, and sustainable solution for hydrogen storage. Utilizing advanced metal hydride technology, these modules excel in various applications, offering a range of benefits:



LOW FOOTPRINT, HIGH DENSITY

With a storage capacity of up to 675 kg H₂ in a footprint as small as 15 m², the C-Series offers unbeatable storage densities.



MODULAR DESIGN

The system's modular nature easily adapts to growing demands, ensuring users can expand capacity as needed.



NO COMPRESSION REQUIRED

DASH C eliminates the need for costly hydrogen compressors, simplifying installation and reducing infrastructure requirements.



LOW LEVELIZED COST OF STORAGE (LCOS)

With no need for costly compression or liquefaction, DASH C offers an attractive levelized cost of storage, ensuring both efficiency and affordability over its lifecycle.



LONG SERVICE LIFE

Built for durability, DASH C systems provide over 20 years of reliable service with minimal performance degradation.



LOW OPERATIONAL EXPENDITURE (OPEX)

With fewer moving parts and no need for compression, DASH C significantly reduces maintenance costs and extends system lifespan.



LOW EMISSIONS

DASH C operates emission-free, making it a sustainable choice for hydrogen storage.



SUPERIOR SAFETY STANDARDS

DASH C's solid-state, low-pressure design ensures safe hydrogen storage, even in sensitive environments such as residential buildings or industrial sites.

DASH C-SERIES COLLECTION

The DASH C-Series sets a new standard for industrial hydrogen storage, providing a compact, solid-state solution. Built for seamless integration, each system offers plug-and-play convenience, incorporating essential auxiliary systems in a containerized format. This flexible and scalable approach allows industries to store high-density hydrogen safely—ideal for on-site use, buffering fluctuating production, or supporting industrial processes.



EXTERIOR VIEW

The DASH C-Series is designed for practicality and durability. The standardized 20-foot ISO container ensures easy transportation and compatibility with industrial operations, while robust construction provides long-lasting performance in diverse environments.

Discover the DASH C-Series product range—with eight different storage capacities, these modules are designed to optimize space, elevate safety, and simplify hydrogen storage to meet your specific needs.

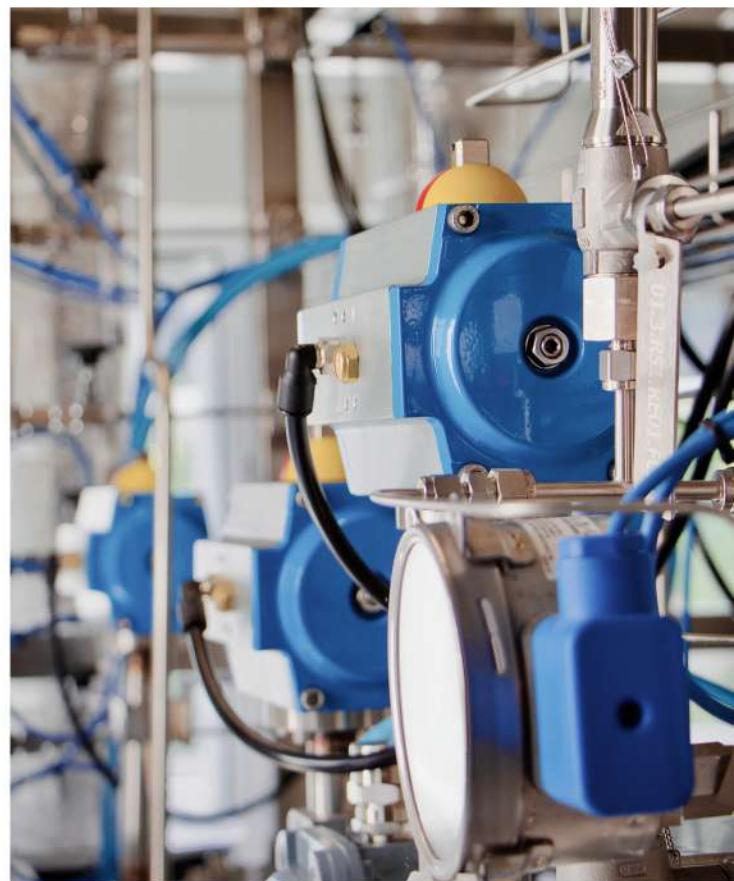
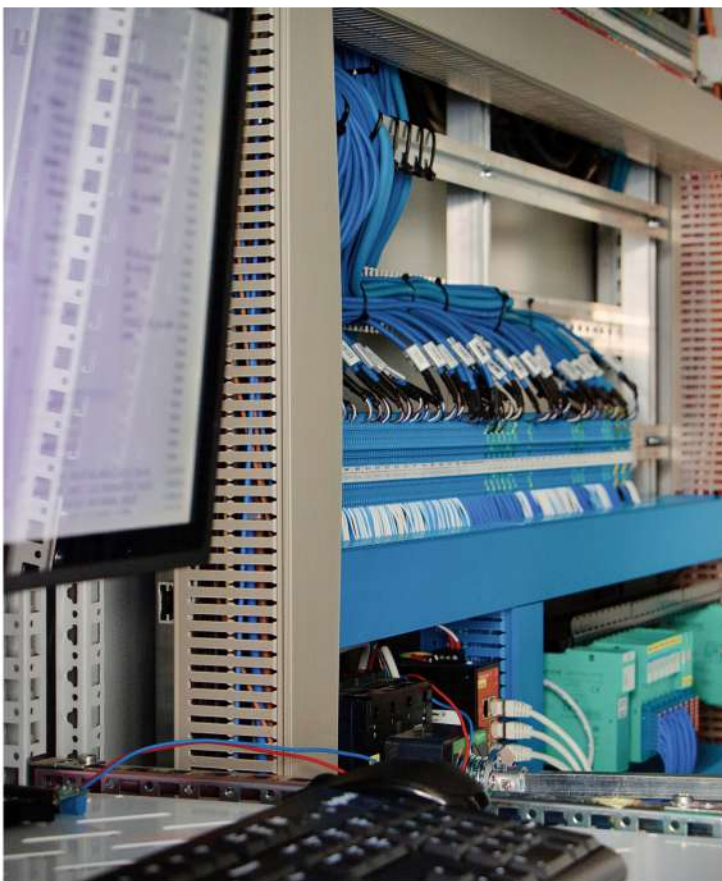


TECHNICAL SPECIFICATIONS

DASH C STORAGE	UNIT	C45	C90	C135	C180	C270	C405	C540	C675
Hydrogen Storage Capacity	kg H ₂	45	90	135	180	270	405	540	675
Nominal Outflow Rate ¹	kg H ₂ /h	2	4	8	8	8	8	8	8
Nominal Inflow Rate ¹	kg H ₂ /h	2	4	8	8	8	8	8	8
Weight	tons	10.4	14.9	19.4	23.9	32.9	46.4	59.9	73.4
Dimensions Container	feet	20	20	20	20	20	20	20	20
Electrical Interface	V AC	1-phase 230	3-phase 400	3-phase 400	3-phase 400	3-phase 400	3-phase 400	3-phase 400	3-phase 400
ATEX zones	Only at exhaust of vent lines								
Admissible Ambient Temperature	°C	-5 to +38							
Hydrogen Supply Purity	%	99.995							
Hydrogen Charging Pressure	bar(g)	30 to 45							
Hydrogen Discharging Pressure	bar(g)	1 to 45 ²							
Expected Service Life	years	> 20							

¹ Depending on Thermal Management System (TMS)
² With our TMS; can be customized for high flow rates

OPTIONAL ADD-ONS



OPTIONAL ADD-ONS

The DASH C-Series offers a range of optional enhancements designed to optimize performance across diverse environments and applications:



PRESSURE TRANSMITTER

Monitors real-time hydrogen pressure for optimal operation and safety.



IN-STREAM HYDROGEN TEMPERATURE SENSOR

Measures hydrogen temperature.



BI-DIRECTIONAL MASS FLOW METER

Tracks hydrogen inflow/outflow.



FIRE AND SMOKE DETECTOR

Detects fire and smoke with both audible and visual alarms for enhanced safety.



LIQUID THERMAL MANAGEMENT SYSTEM (TMS)

Optimizes flow rates and desorption pressure based on available thermal power and temperature.

Note: Not available for models C405, C540, and C675.



LIGHTNING PROTECTION

Provides robust lightning protection for the container to ensure secure operation.

TECHNICAL SERVICES

Our comprehensive support offerings are designed to keep your DASH C-Series system running reliably and efficiently:



ON-SITE ASSISTANCE

Expert assistance during setup for optimal system functionality.



TECHNICAL SUPPORT

Available remotely or on-site for troubleshooting and preventative maintenance.



SPARE PARTS WARRANTY

Maintain system reliability with warranty coverage for essential spare parts.



WARRANTY EXTENSION

Extend warranty coverage annually when paired with our technical support.



COMPLIANCE

Every DASH C-Series system is based on the strict quality requirements of GRZ with certifications that meet international safety and performance standards:



CE CERTIFICATION

Compliance with European safety, health, and environmental standards.



ATEX DIRECTIVE 2014/34/EU

Certified for safe use in potentially explosive environments.



PRESSURE EQUIPMENT DIRECTIVE 2014/68/EU

Guarantees safe design and manufacturing of pressure equipment.



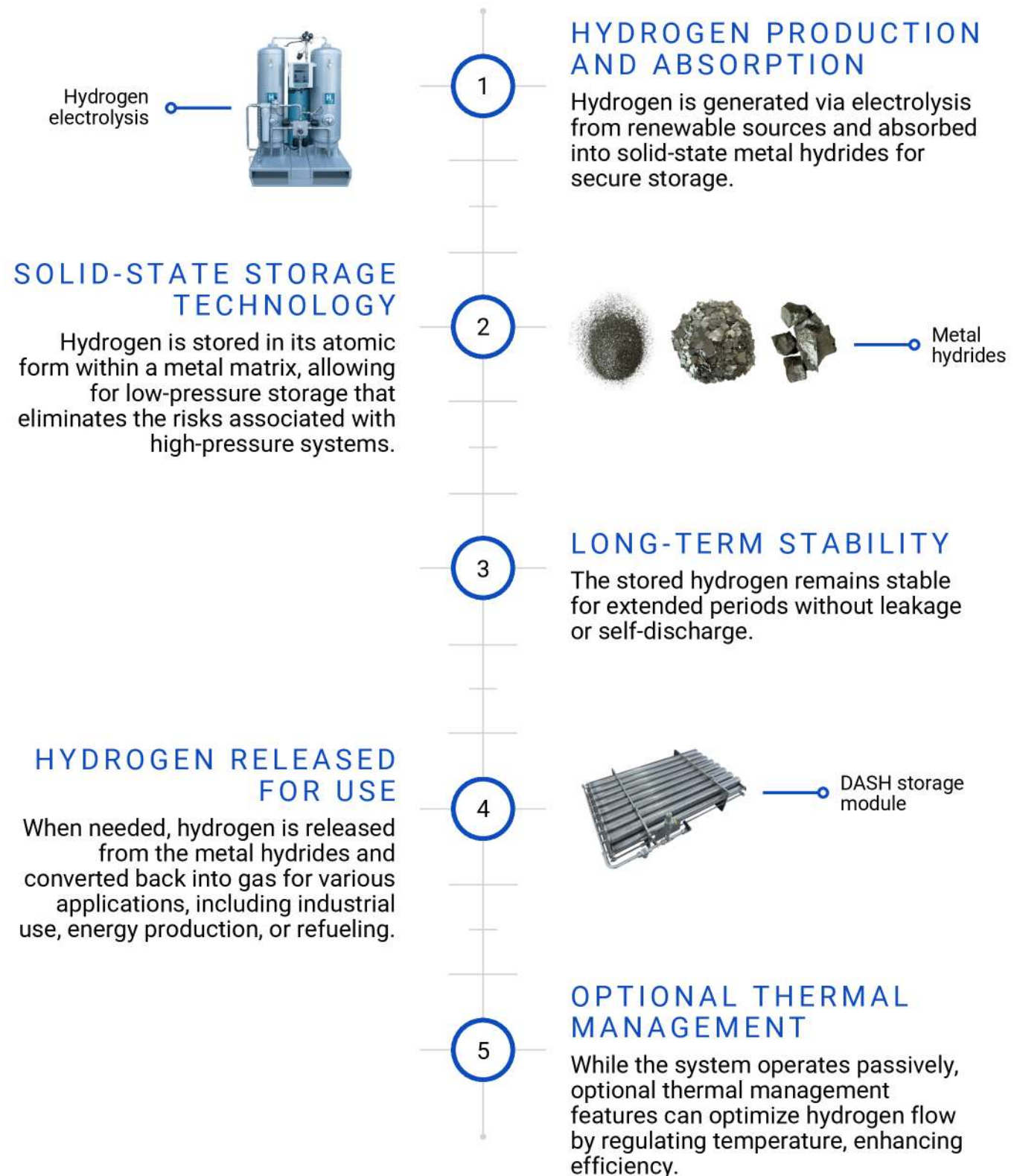
LOW VOLTAGE DIRECTIVE 2014/35/EU

Ensures electrical equipment meets safety requirements for low voltage operation.



OPERATIONAL OVERVIEW

DASH hydrogen storage modules safely and efficiently store hydrogen using advanced metal hydride technology. This proprietary method absorbs hydrogen in solid form, providing long-term stability and security.



ABOUT GRZ TECHNOLOGIES

At GRZ Technologies, we stand at the forefront of hydrogen storage innovation, dedicated to reshaping the future of clean energy through our patented metal hydride technology. With decades of research and development, we deliver safe, efficient, and high-density hydrogen storage solutions for diverse applications, from residential use to large-scale applications.

PARTNERSHIPS

Our partnerships with industry leaders like Hyundai, AMPO, Sabanci, and the fischer group propel us forward, enabling advancements in backup power and renewable energy integration—all while prioritizing reliability and cost-efficiency.



A WORLD
FUELED BY
RENEWABLE
ENERGY –
DAY AND NIGHT,
SUMMER AND
WINTER.

Fueled by a passion for a sustainable energy future, GRZ Technologies is not just innovating; we are revolutionizing the storage and utilization of hydrogen, setting new benchmarks for excellence in the industry.

CONTACT US TODAY AND BE PART OF THE CLEAN ENERGY REVOLUTION



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