



ΔHN Materials
Incheon, Korea

AHN Materials Inc. dreams of becoming a future energy company

Research and develop hydrogen storage cartridge by utilizing cryogenic heat transfer technology and 77K liquid nitrogen

AHN Materials Inc. aims to realize a paradigm shift in energy by utilizing, storing, and distributing cryo-compressed hydrogen and liquid hydrogen.

AHN Materials Inc. Hydrogen storage cartridge and solution



Cryo-compressed hydrogen cartridge



Liquid hydrogen storage cartridge



Mobile liquid hydrogen station

- '20
 - Establishment of a corporate research center
 - Core technology development and patent registration
- '21-22
 - 2020 Preliminary Startup Package Best Company Selection
 - Technology Guarantee Fund Direct Investment (Corporate Value Achieved 5 Billion Won)
 - 2021 Laboratory Early Startup Package Best Company Selection
 - Quality Management System Certification (ISO 9001:2015)
 - Technology Guarantee Fund Incheon Innovation PLUS(+)100 Company Certification
- '23
 - Military Service Special Research Institute Selection
 - Startup Leap Package Business Selection
 - Prototype Development Complete
 - Prototype Production Complete
 - Participation in CES 2023 (Las Vegas, USA)
- '24
 - Sunbo Angel Partners Investment
 - SINCEWIN Investment
 - Regulatory Sandbox Program
 - Application Testing
 - Deep Tech Tips R&D Selection

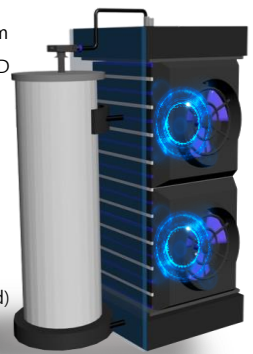
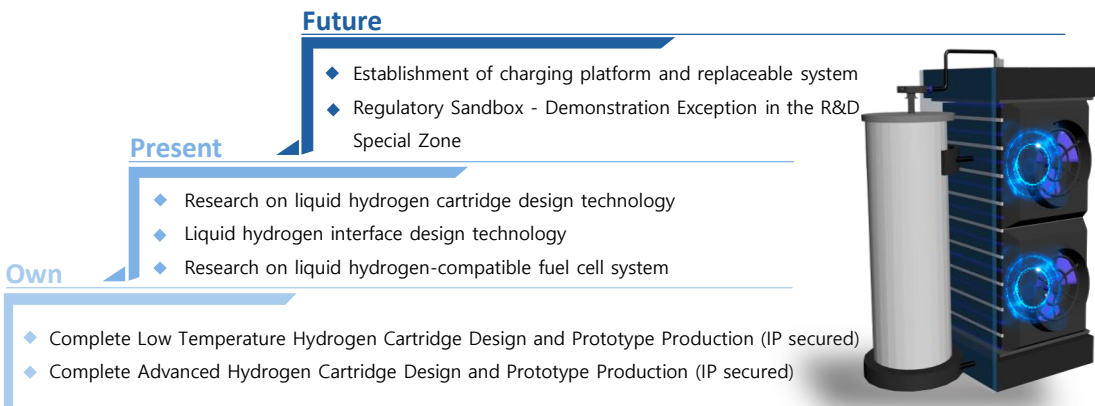
AHN Materials Inc. hydrogen storage cartridge



TYPE-4 Ultra high-pressure gas storage

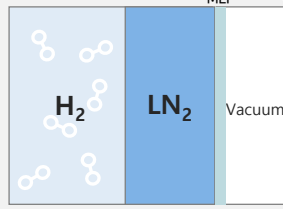
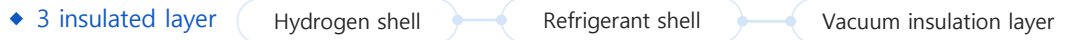
ΔHN		ΔHN		Property	TYPE-4 Ultra high-pressure gas storage
Cryo-compressed hydrogen cartridge (High pressure)		Liquid hydrogen cartridge (atmospheric pressure)			
77K, 100 bar	77K, 200 bar	77K, 1 bar		Condition	RT, 700 BAR
31.2	49.5	70.8		Capacity (kg/m ³)	39.8

AHN Materials Inc. achievements and future plans



Cryo-compressed hydrogen cartridge

Using double layer containers and separate cover to manufacture hydrogen storage cartridge



◆ Hydrogens storage capacity

Hydrogen volume	Hydrogen amount	LN2 amount
300mL	9.6g	30g
1L	34g	70g
5L	166g	220g
10L	321g	322g

High hydrogen storage capacity

Effective way to store hydrogen in portable cartridge

Ensuring marketability and safety

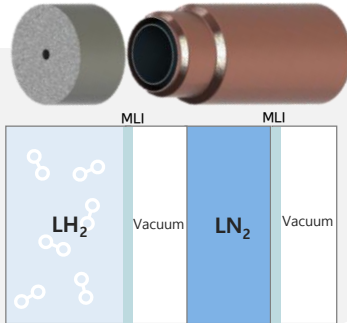
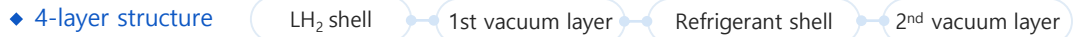
Due to low storage pressure and high capacity

Various storage volume

From portable to large tanks depending on customer needs

Liquid hydrogen storage cartridge

4-layer structure with 1 refrigerant layer and 2 vacuum insulation layers



No additional coolant system

Storage liquid hydrogen without the need for an additional coolant system

Liquid nitrogen utilization

Liquid hydrogen is used as a refrigerant, absorbing external radiant heat to evaporate before liquid hydrogen

ZERO BOIL OFF rate

Two vacuum layers with multi-layer insulation maintain internal cryogenic temperature and prevent external radiation heat.

Mobile liquid hydrogen station

Operation of a mobile hydrogen station platform equipped with a large liquid hydrogen cartridge inside the vehicle



Sustainable charging system

Refuel liquid hydrogen via charging protocol

Interface charging platform

Capable of simultaneously charging liquid hydrogen and liquid nitrogen

Mobile charging station

The hydrogen charging platform allows the replacement of the hydrogen drone fuel cell stack