SH_2APED

STORAGE OF HYDROGEN: ALTERNATIVE PRESSURE ENCLOSURE DEVELOPMENT

Project ID	101007182
PRR 2025	Pillar 3 - H_2 End Uses - Transport
Call Topic	FCH-01-1-2020
Project Total Costs	1 993 550.00
Clean H_2 JU Max. Contribution	1 993 550.00
Project Period	01-01-2021 - 30-09-2024
Coordinator Beneficiary	PLASTIC OMNIUM NEW ENERGIES, FR
Beneficiaries	MISAL SRL, OPTIMUM CPV, OMB SALERI SPA, PLASTIC OMNIUM ADVANCED INNOVATION AND RESEARCH, BUNDESANSTALT FUER MATERIALFORSCHUNG UND -PRUEFUNG, UNIVERSITY OF ULSTER

https://sh2aped.eu/

PROJECT AND GENERAL OBJECTIVES

The goal of the SH_2APED project is to develop and test, at technology readiness level 4, a conformable and cost-effective hydrogen 70 MPa hydrogen storage system with increased efficiency and exceptional safety performance.

NON-QUANTITATIVE OBJECTIVES

Regarding certification procedures, the project aims to contribute to the revision of regulations.

PROGRESS, MAIN ACHIEVEMENTS AND RESULTS

The project has achieved significant technical advancements, such as:

- Integration of fiber optic sensors in composite pressure vessels.
- Improved safety design of 70 MPa hydrogen storage system.
- Advanced computational fluid dynamics modeling.
- Development of a conformable hydrogen storage system with microleaks-no-burst technology.
- Improved manifold design for hydrogen tanks.
- Enhanced manufacturing processes, ex. blow modeling technology for liners.

PROJECT TARGETS

Target source	Parameter	Unit	Target	Achieved to date by the project	Target achieved?	SoA result achieved to date (by others)	Year for reported SoA result
Project's own objectives	H_2 storage volume for estimated design space	%	> 45	42	⚙	41	2021
	Cost for tank system	€/kg H_2	400	>850	⚙	DOE target	2022
	Low-cost process for liner	1M	1M	3M	✓	N/A	2021
	Burst pressure (R134)	MPa	> 157.5	170	✓	157	2022
	Hydraulic Pressure Cycle test 87,5MPa, 20C	-	22 000	> 22 000	✓	N/A	N/A
	Gravimetric efficiency	%	> 5.7	6.10	✓	N/A	N/A
	Permeation	$cm^3/h/l$ at 55°C	< 46	< 46	✓	N/A	N/A

Clean Hydrogen Partnership
Co-funded by the European Union