

**Title:**

Safe Composite Pressure Vessels with Self Structural Health Monitoring Capacity

**Brief description:**

The most efficient and mature means of storing hydrogen are currently Type IV high-pressure composite vessels for on-board applications. However, this technology still requires extensive research and development to reduce costs and improve both performance and durability in order to be commercially viable. Research departments are using conservative safety factors for product life cycle/burst pressure ratios and simplified models that result in oversized and cost-intensive tanks. The HYMOCA project is investigating new perspectives for the design of high-performance composite tanks with self-sensing capabilities to find optimized, safe and cost-effective solutions for the next generation of high-pressure vessels. An integrated sensory for structural health monitoring would have great leverage to achieve both economical and safe designs. The progress within HYMOCA has the potential to open up a new spectrum of applications in multiple sectors, implying the creation of new market opportunities in the corresponding hydrogen value chain.

**Motivation:**

- Sensor technology
- CO<sub>2</sub>-reduction (decarbonization)

**Objectives:**

- Self Structural Health Monitoring
- Increasing the safety of pressure vessels

**Duration:**

June 01, 2023 to May 31, 2026

**Funding and project sponsor:**

Funds from the European Union, SAB Sächsische Aufbaubank

**Partners:**

Luxembourg Institute of Science and Technology (LIST); <https://www.list.lu>

Izmir Institute of Technology (IZTECH); <https://www.iyte.edu.tr>

Fraunhofer Institute for Machine Tools and Forming Technology (IWU); <https://www.iwu.fraunhofer.de>

IZOREEL Composites; <https://www.izoreel.com.tr>

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**Link to the project homepage:**

<https://www.m-era.net/materipedia/2022/hymoca>