



**Omniseal  
Solutions**  
SAINT-GOBAIN

# ENERGY: CARBON-FREE



Sealing & Material Solutions  
For Hydrogen Value Chain



H<sub>2</sub>  
Hydrogen

**0** ZERO  
emissions

Beyond the boundaries of  
**POSSIBLE**

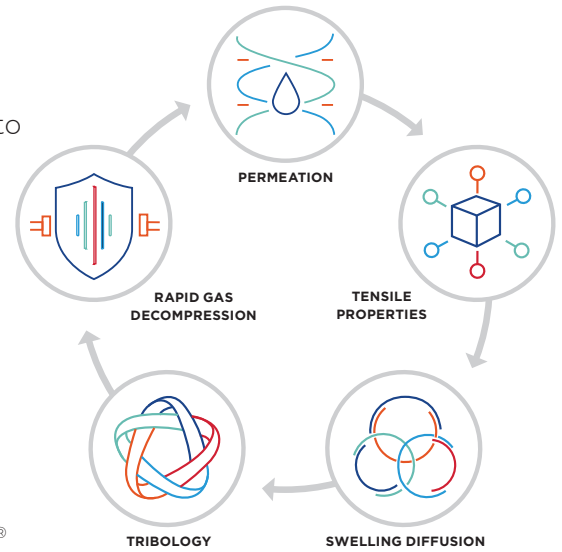
  
SAINT-GOBAIN

# Our Proven Sealing & Material Solutions Protect Your Hydrogen Applications' Performance & Efficiency

Hydrogen continues to be a key contributor to the energy transition towards a greener future and Net-Zero objectives; however, the journey can be complex. Omniseal Solutions is a reliable partner, understanding the multi-facets of the **HYDROGEN VALUE CHAIN** from Production, Transport & Storage to Refueling Stations.

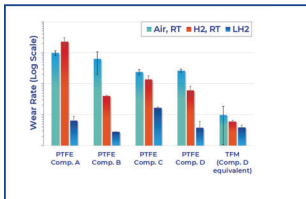
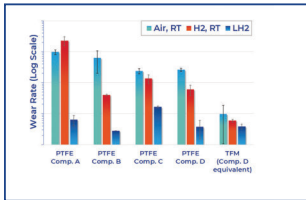
- Our precision in design engineering ensures that solutions are reliable and durable – even with technically demanding specifications and under extreme environments.
- With memberships in international hydrogen technical committees making changes in new regulations and standards, we remain knowledgeable of the challenges facing component manufacturers and respond quickly.
- We own a comprehensive dataset of selected proprietary Rulon® fluoropolymer and Meldin® thermoplastic materials from several testing campaigns at external laboratories worldwide (see below our various testing methods, capabilities and results).

**GH2** **LH2** **Up to 100MPa**

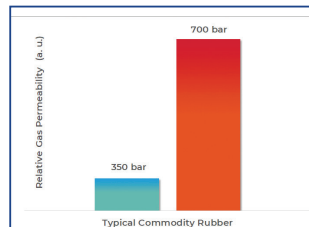
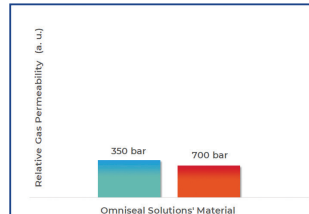
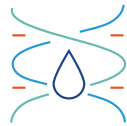


By conducting rigorous material characterization testing followed by numerical simulation and application testing, we can custom design sealing solutions that match your technical and economical objectives.

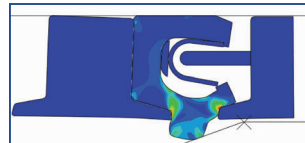
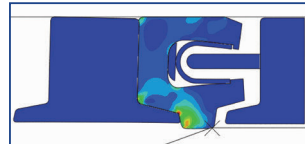
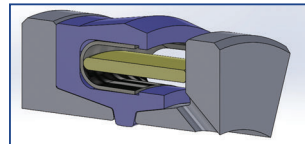
## Tribology



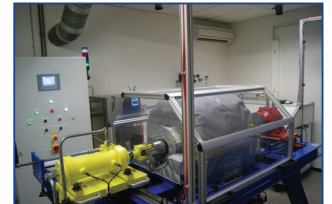
## Permeation



## Simulation



## Application Testing



HIGH PRESSURE

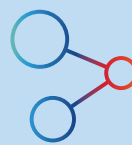


CRYOGENIC

By contributing at an early stage of your development process, our energy experts can engineer solutions that give you a **TECHNOLOGY ADVANTAGE**.



EXPERT PROBLEM SOLVING



MATERIAL EXPERTISE



COLLABORATIVE SPIRIT

# PRECISION SEALING & MATERIAL

## PRODUCTION

### Green Hydrogen

#### ELECTROLYZER CELLS

#### **Omniseal® Gasket Solutions Made From Proprietary Rulon® Fluoropolymer & Meldin® Thermoplastic Material**

Our technical experts have developed cost-effective manufacturing capabilities that allow us to supply single-piece, polymer gaskets above 2 METERS - larger than any sheet size available on the market today.

#### Technology Advantage

- Material creep relaxation characterization in accordance to EN13555
- Proven tightness performance with Helium
- Chemical compatibility with Hydrogen, Oxygen and KOH solutions
- Cost optimization by reducing waste material

### Blue Hydrogen

#### CARBON CAPTURE & STORAGE (CCS)

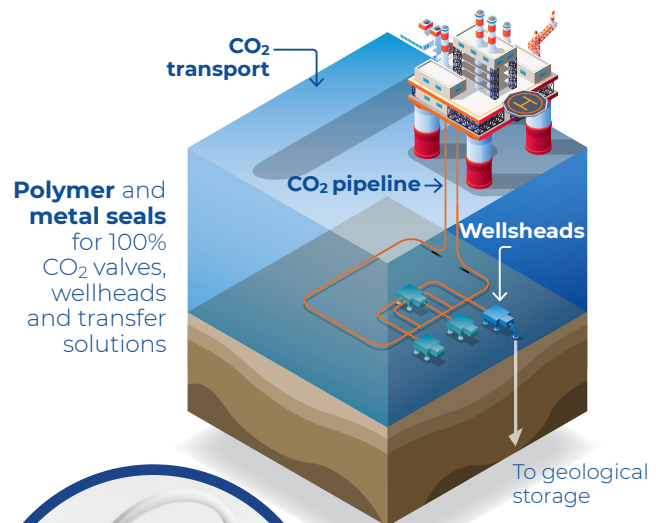
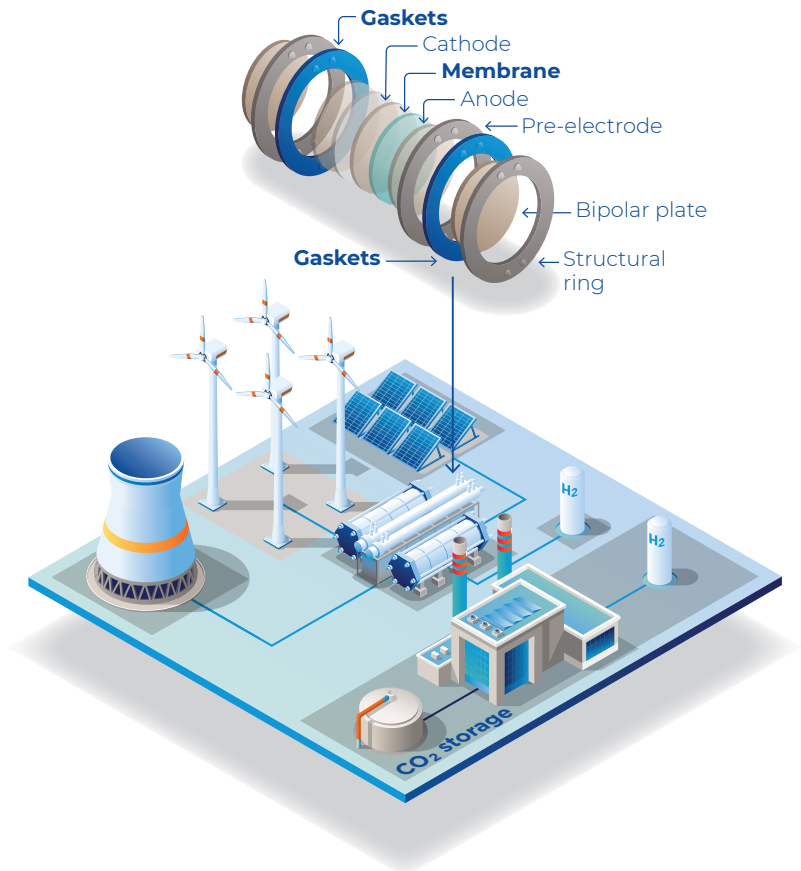
#### **100% CO<sub>2</sub> Certified, Proprietary Fluoroloy® & Meldin® Material**

Several of our proprietary materials have successfully passed a 100% CO<sub>2</sub> immersion testing in liquid and super-critical state, compliant with Pass/Fail criteria of NORSOK M-710, Ed. 3.

Click on QR Code to view case study!

#### Technology Advantage

- Superior lifetime compared to elastomers
- Reduced downtime and improves reliability even in subsea environment
- Third-party material certificates available upon request
- Customized Omniseal® spring-energized seals cope with stringent operating conditions of CCS applications



# SOLUTIONS FOR YOUR CRITICAL

## TRANSPORT & STORAGE

### HYDROGEN TRANSPORT, TRANSFER & STORAGE

#### Engineered Omniseal® Polymer & Metal Sealing Solutions

At low temperatures, elastomers become brittle and may fail during rapid depressurization by explosive decompression. Therefore, thermoplastic and metallic materials are highly recommended solutions.

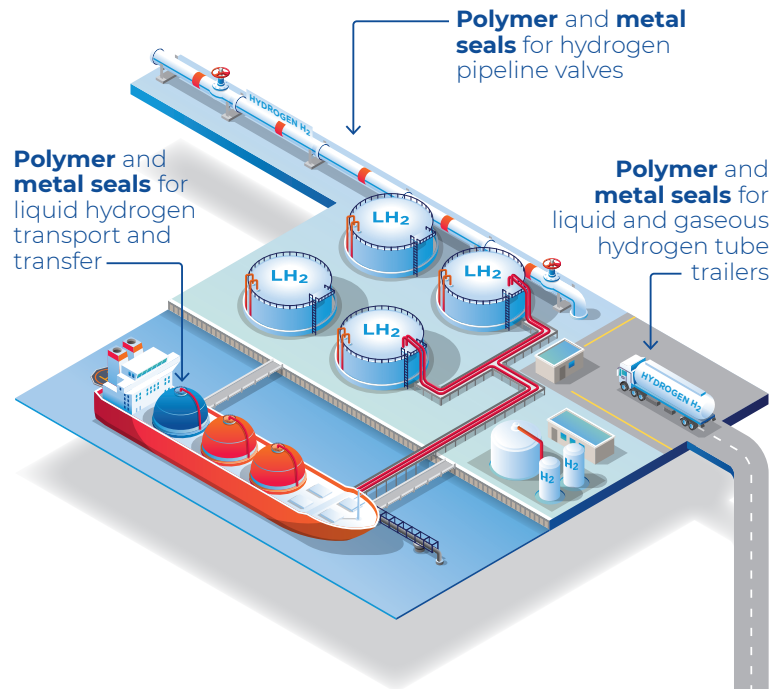
Our Omniseal® polymer and metal seals can be used from  $-253^{\circ}\text{C}$  ( $20^{\circ}\text{K}$ ) up to extreme temperatures  $> +600^{\circ}\text{C}$ , while maintaining their integrity and excellent tightness at extremely high pressures.

#### Technology Advantage

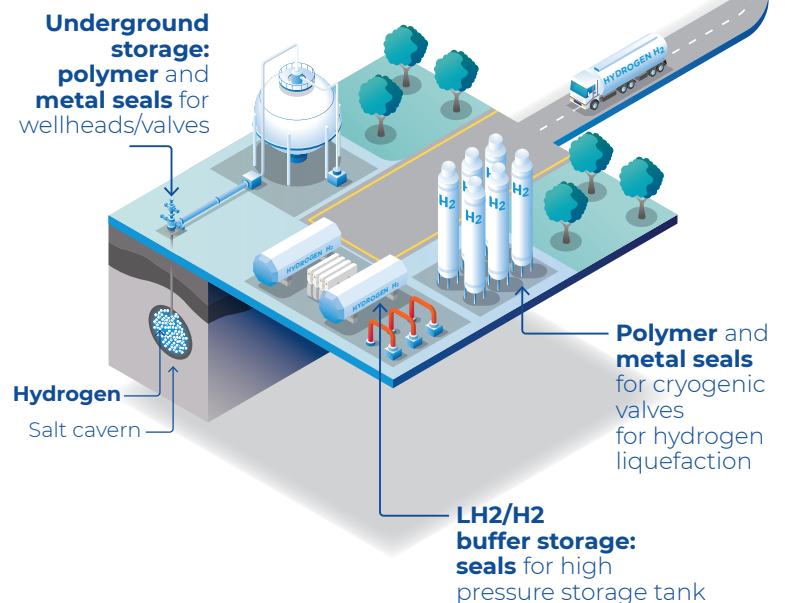
- Decades of proven experience with gas and liquefied gas
- Design compliant with low-fugitive emission standards
- Numerical thermo-mechanical simulation
- Material characterization (permeation, RGD)



### TRANSPORT

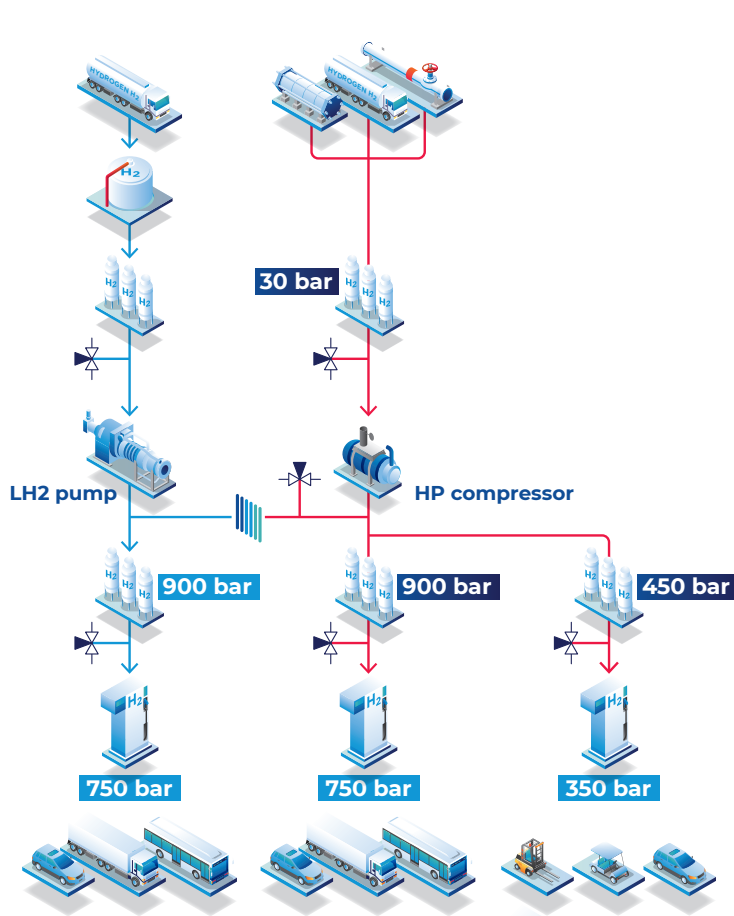


### STORAGE



# HYDROGEN APPLICATIONS

## REFUELING STATIONS



### Engineered Omniseal® Polymer & Metal Seals For Extreme Operating Conditions

Our extensive engineering and testing experience in high pressure and cryogenics enable us to design proven sealing solutions for a wide variety of applications in hydrogen refueling stations.

We can customize solutions based on numerical simulation and a wide range of proprietary Fluoroloy® and Meldin® formulations fully characterized in H<sub>2</sub>/LH<sub>2</sub> up to extreme pressures.

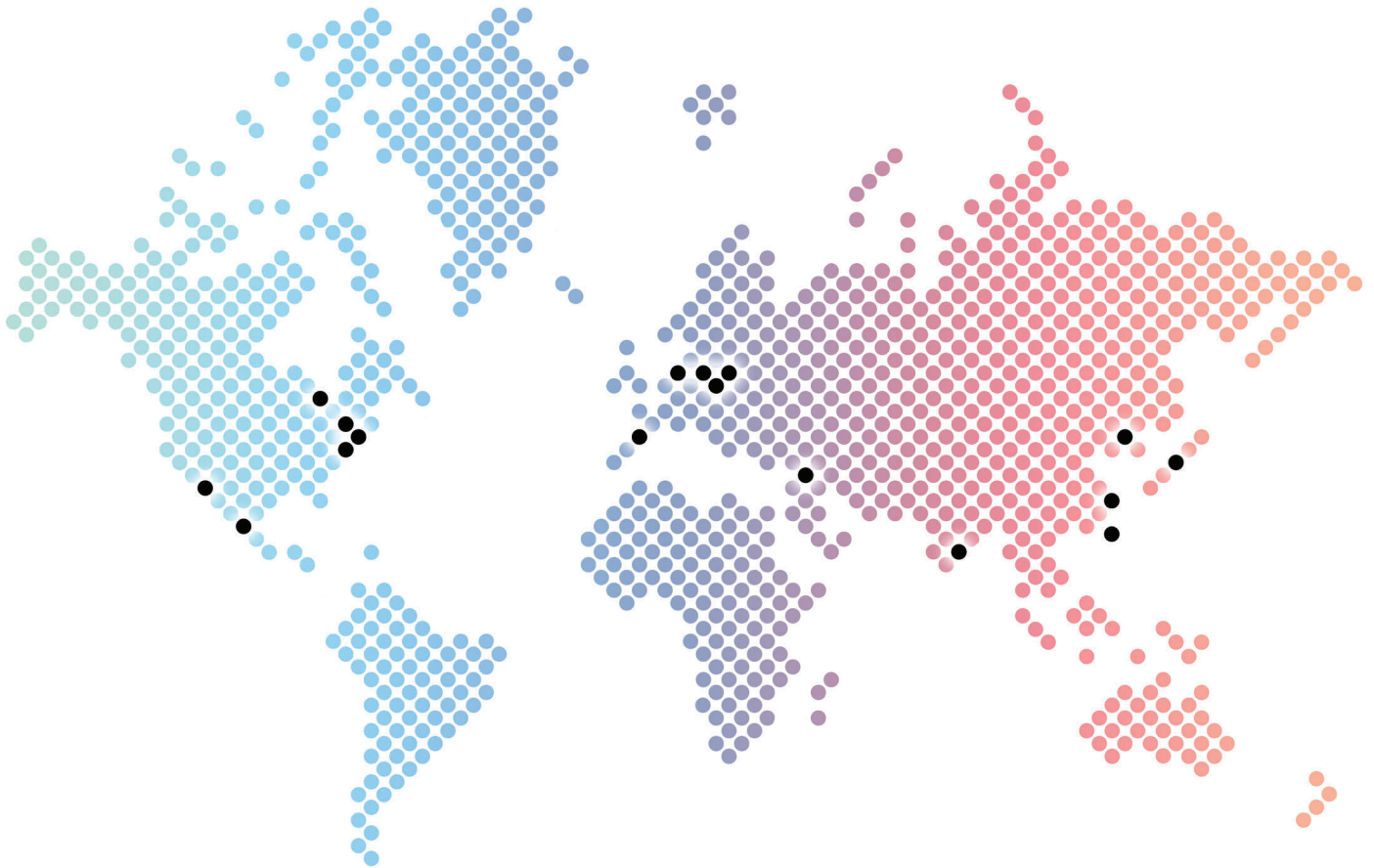
### Main Applications:

- H<sub>2</sub>/LH<sub>2</sub> pumps and compressors
- H<sub>2</sub>/LH<sub>2</sub> valves, nozzles, couplings, breakaway couplings
- H<sub>2</sub>/LH<sub>2</sub> buffer storage

### Technology Advantage

- Expertise in high pressure and cryogenic applications
- Numerical thermo-mechanical simulation
- Material characterization (H<sub>2</sub>/LH<sub>2</sub> tribology, permeation, RGD)
- Large choice of polymer materials (PTFE, PEEK, PAI, PI) and H<sub>2</sub> compliant metals

# ONE GLOBAL TEAM... A DEDICATED CUSTOMER FOCUS



## GLOBAL & LOCAL PRESENCE

With 17 manufacturing facilities in 10 different countries, Omniseal Solutions is a diverse group that is committed to being customer centric.

**Contact our energy / hydrogen team of experts for more information. We have local resources to support you!**

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[www.omniseal-solutions.com](http://www.omniseal-solutions.com)

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