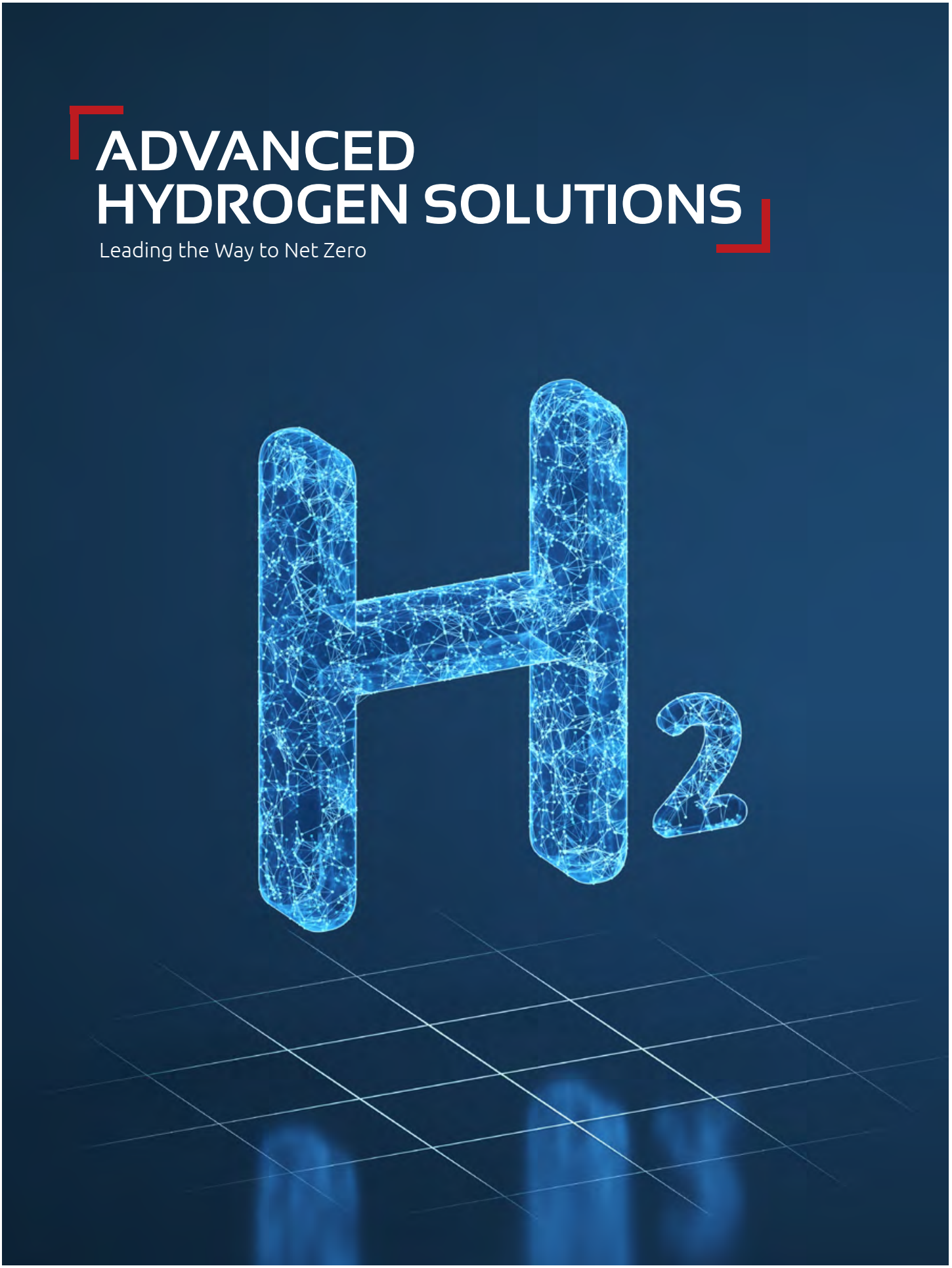
HOT

fluidXlab

ADVANCED HYDROGEN SOLUTIONS

Leading the Way to Net Zero



ADVANCED HYDROGEN SOLUTIONS

The transition towards renewable energy sources is leading to significant changes in revenue streams and business models. Traditional fluid testing technologies, originally designed for the oil and gas sector, often fall short in meeting the stringent requirements of Cleantech applications like hydrogen operations. With the Cleantech market for Net Zero rapidly expanding, operators are increasingly in need of quick and accurate data to minimise project risks and make informed investment decisions.

fluidXlab is your premier destination for advanced hydrogen solutions. As a leader in the field of hydrogen laboratory studies, we specialise in providing tailored solutions for a wide range of critical areas in a future hydrogen-driven energy system like hydrogen diffusion, corrosion analysis and fluid behaviour assessments.

Our state-of-the-art facilities and expert team are dedicated to investigating the complexities of hydrogen quality, rock-fluid interactions, and caprock integrity investigations with meticulous precision. We offer more than just testing and analysis – we deliver transformative insights and consulting services that empower our clients to excel in the realm of hydrogen technology.

LEVERAGING YEARS OF EXPERTISE, fluidXlab SPECIALISES IN COMPREHENSIVE HYDROGEN LABORATORY SOLUTIONS ACROSS THREE KEY AREAS:

ADVANCED HYDROGEN SOLUTIONS

H_2 FACILITIES & INFRASTRUCTURE

H_2 FLUID PROPERTIES & PHASE BEHAVIOUR

H_2 GEOLOGICAL STORAGE

H_2 FACILITIES & INFRASTRUCTURE

Enable Efficient, Safe and Long-Term Operations

Under typical pressure and temperature environments found in facilities related to gas/hydrogen storage, hydrogen solely manifests as a diatomic gas. Being the lightest element, its distinctive properties of low density, low viscosity, and a weak negative Joule-Thomson effect, coupled with its high diffusion tendency, give rise to particular demands on material selection in operations with pure hydrogen or gases with hydrogen admixture.

Partnering with fluidXlab enables you to confidently address the complexities of hydrogen compatible infrastructure, paving the way for safe operations.

PROTECTING YOUR INFRASTRUCTURE

METAL FLUID COMPATIBILITY

Select the optimum materials

- Autoclave Experiments

FLOW ASSURANCE

We ensure smooth, efficient hydrogen flow by analysing potential flow challenges and designing solutions.

- Solid Precipitation
- Chemical Screening

PVT AND PHASE BEHAVIOUR

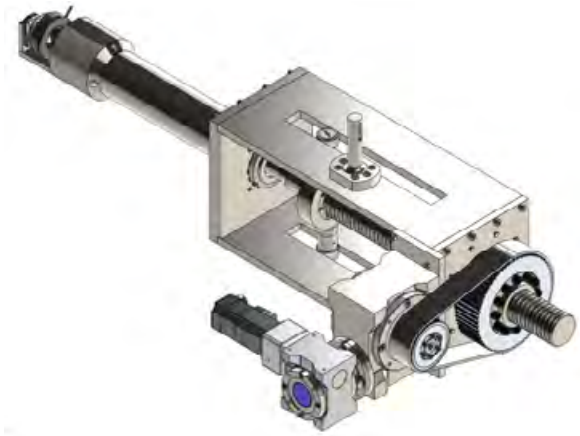
- Dynamic Viscosity
- Density
- Compositional Analysis
- Solubility (H_2 in Brine, Water in H_2)

CORROSION STUDIES

We identify the most suitable materials for your facilities, preventing leaks and environmental damage.

- Pipe Material Studies
- Autoclave Experiment

VISUAL PVT CELL FOR HYDROGEN



H_2 FLUID PROPERTIES & PHASE BEHAVIOUR

De-risk Hydrogen Projects with Accurate PVT Analysis and Fluid Behaviour

fluidXlab is dedicated to acquiring laboratory data on diverse properties of hydrogen in the presence of impurities at the highest possible precision. We measure properties related to the thermodynamic and transport behaviour of hydrogen and hydrogen mixtures. With our dedicated hydrogen laboratory team, we aim to provide insightful solutions for engineering design, ultimately reducing uncertainties associated with hydrogen storage, transport and related applications.

Our cutting-edge experiments involve fluid and gas mixtures, all while adhering to the highest health, safety, and environmental standards.

SERVICES FOR FLUID DATA ACQUISITION IN HYDROGEN PROJECTS

H2 QUALITY ANALYSIS

- Compositional Analysis
- Recombination/Synthesis

PVT PROPERTIES

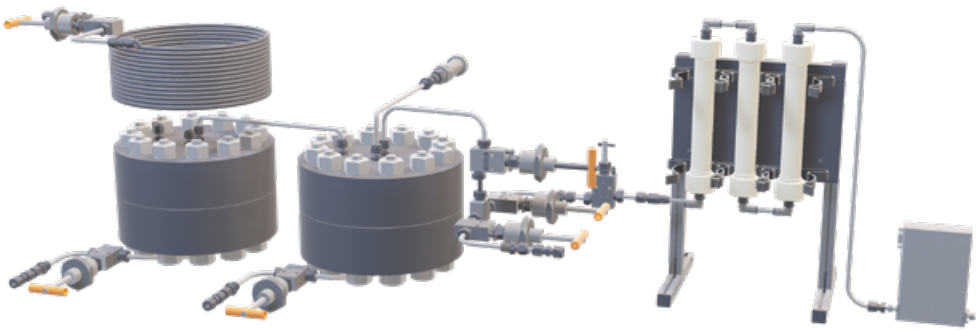
- Gas Density (Single Phase and VLE Density) for H_2 and Mixtures
- Dynamic Viscosity (H_2 and Mixtures)
- Contact Angle

PHASE BEHAVIOUR/COMPATIBILITY

- Constant Composition Expansion (CCE)
- Constant Volume Depletion (CVD)
- Differential Liberation Expansion (DLE)
- Diffusion (Gas-Gas, Gas-Liquid)
- Solubility (H_2 in Brine, Water in H_2)
- Interfacial Tension (IFT)
- Single and Multicomponent Adsorption

VISUAL PVT CELL FOR HYDROGEN

GAS SATURATION UNIT



H_2 GEOLOGICAL STORAGE

Solutions for Integrity and Performance Assessment

The underground storage of hydrogen is a critical topic that concerns all operators of underground gas storage facilities. Safely storing pure hydrogen or hydrogen-natural gas blends necessitates comprehensive testing and a deep understanding of the associated processes. A meticulous assessment of all relevant factors is paramount to ensure the successful and effective deployment of hydrogen storage solutions.

SERVICES ENSURING SAFE GEOLOGICAL STORAGE OF HYDROGEN

CAPROCK INTEGRITY

- Capillary Entry Threshold Pressure

FLOW ASSURANCE

- Solid Precipitation
- Hydrate Formation
- Chemical Screening

ROCK-FLUID INTERACTION

- Autoclave Experiments
- Gas Adsorption Test
- Specific Surface Area (BET)
- Geochemical Simulation

EFFECTIVE DIFFUSION CHARACTERISATION

- Binary / Multicomponent Gas-Gas Diffusion
- Binary / Multicomponent Gas-Liquid Diffusion

SCAL

- Relative Permeability
- Capillary Pressure
- Core Analysis
- Combined Amott – USBM Wettability

RESERVOIR FLOW ANALYSIS

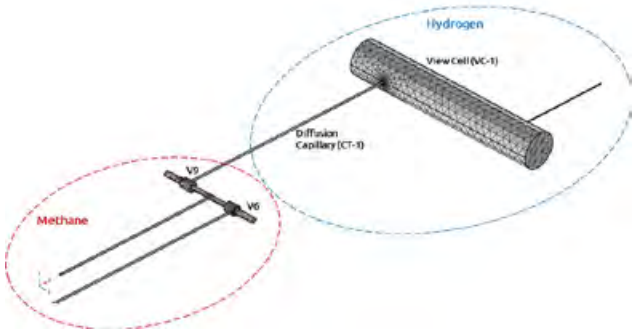
- Core Flooding
- Microfluidics Flooding
- Microbial Activity Investigations

PHASE BEHAVIOUR & PVT

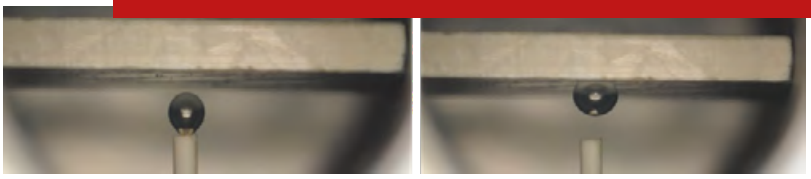
- Phase Behaviour
- Density and Viscosity
- Solubility (H_2 in Brine, Water in H_2)
- Interfacial Tension (IFT) & Contact Angle

Our range of laboratory services is comprehensive and tailored to encompass various critical areas essential for gas storage projects. From evaluating caprock integrity and analysing flow assurance, assessing rock and fluid interactions, conducting Special Core Analysis (SCAL), studying phase behaviour, to characterising fluids and measuring petrophysical properties – we cover it all. With our innovative solutions including microfluidics technologies, we aim to mitigate project risks effectively and to optimise the success of your gas storage endeavours.

H_2 DIFFUSION STUDY



FLUID-FLUID / FLUID-ROCK INTERACTION TEST



Interfacial Tension (IFT) Contact Angle

CONTACT US TODAY

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LOOKING FOR A PARTNER WHO'LL MAKE A DIFFERENCE?

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