

# LH<sub>2</sub>

## Measuring bench for liquid hydrogen

For measuring properties at 20K



A test bench dedicated to liquid hydrogen

THEMACS Ingénierie markets a thermophysical property measurement bench dedicated to liquid hydrogen applications, operational down to 20 K.

This system enables the precise characterisation of materials and components under cryogenic conditions (thermal conductivity, thermal resistance, associated behaviours), as close as possible to real-life conditions of use.

Designed for R&D and industry, this bench is intended for players in the fields of hydrogen storage, transport and technologies who require reliability, traceability and compliance with measurement standards.

The measuring bench also allows testing and quantifying leaks on components under hydrogen or helium up to 200 bar

The bench options also enable mechanical characterisation under cryogenic conditions, including measurement of elastic modulus, tensile strength and coefficient of thermal expansion (CTE). These measurements down to 20 K provide a comprehensive understanding of material behaviour for liquid hydrogen applications.



2 bis Alfred Nobel  
77420 Champs-sur-Marne  
FRANCE



+33 6 29 82 44 34  
contact@themacs.fr

[www.themacs-engineering.com](http://www.themacs-engineering.com)

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## Bench features and options

For measuring properties at 20K



### Features:

- Temperature range: 6 to 300K
- Air-cooled compressor (no additional water circuit required)
- Power supply: 220V single-phase
- Vacuum chamber with 600mm internal diameter
- Temperature control via PID regulator
- Pumping system: Scroolvac primary pump and 450L/s turbo molecular pump
- Vacuum chamber up to 10E-7mbar
- Parameter control unit adaptable to your needs

### Option:

#### Thermal properties:

Measurement of thermal conductivity and thermal capacity using a modulated method. Suitable for anisotropic materials (composite and multilayer materials). Capacity to install 4 samples in the chamber.

#### Guarded hot plate:

Enables measurement of foam or multilayer insulators using the guarded hot plate method maintained between 10 and 300K. Sample size is 300x300mm.

#### Leak test:

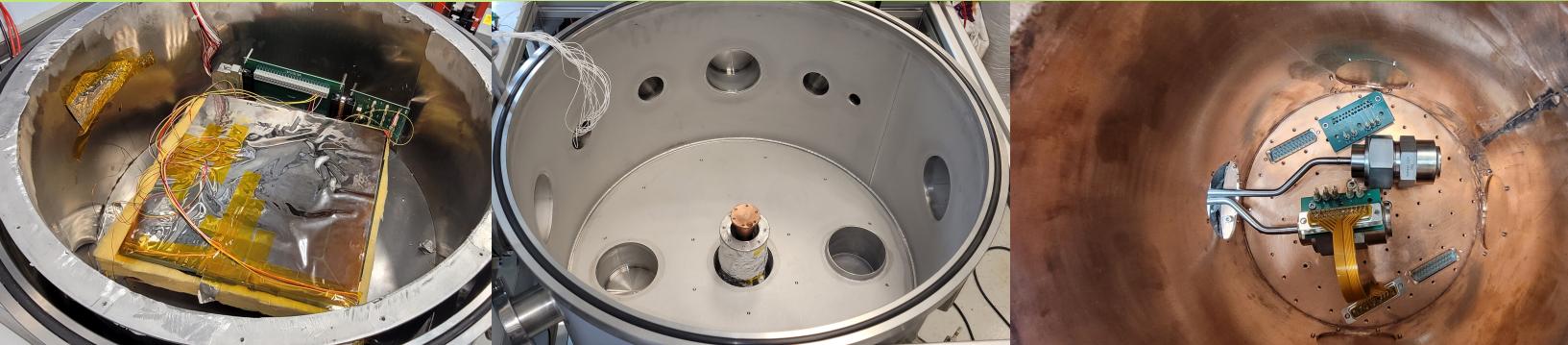
Leak tests on circuit components performed at 10 to 300K under hydrogen or helium pressure up to 200bar. Up to 3 pieces of equipment can be tested in the measurement area. Measurement area 200mm in diameter and 250mm high. Leak detection threshold: 10-13 Pa.m3/s

#### Tensile testing:

30kN tensile testing machine. Thermal break for rapid temperature reduction of the sample.

#### CTE measurement:

Measurement of expansion between 10 and 300K.



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