



LEAK DETECTION SYSTEMS FOR HYDROGEN PRESSURE VESSELS

WE ARE SPECIALISTS IN LEAK DETECTION

VES offers a wide range of systems and solutions for a broad range of industries across the world. Our innovative leak testing technologies are transforming high volume production lines of high pressure vessels used in hydrogen powered vehicles.



HOW DO WE ACHIEVE THIS?

Almost thirty years ago VES' foundations were laid in providing leak testing solutions for leading automotive fuel tank manufacturers globally, helping contain and maintain safe limits on greenhouse gas emissions.

A new generation of high pressure storage vessels for use in hydrogen powered vehicles requires specialised leak testing solutions. Coupled with VES' proven capabilities and the drive towards zero emission mobility we were already working closely with our customers in our field of expertise.

Our extensive knowledge and experience have enabled us to provide complete high pressure leak testing integrated systems.

Our solutions are contributing towards the global push for **carbon neutrality**.

Components



High Pressure Generation Unit (HPGU) and Leak Test Module (LTM)

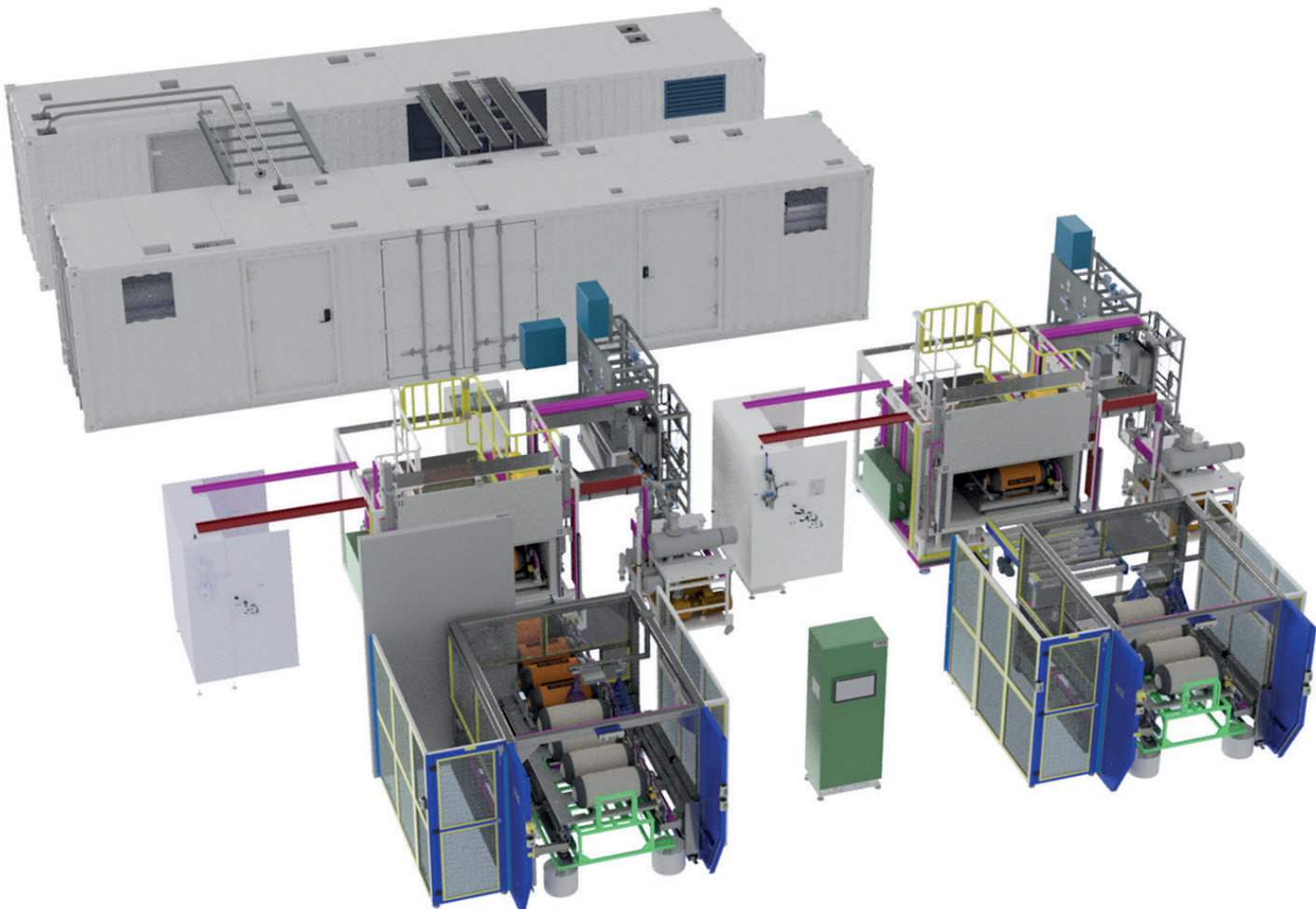
Essentially, the HPGU and the LTM are the two main components required for leak testing high pressure hydrogen storage vessels.

HPGU CONTAINER ASSEMBLY

The high pressure generating unit (HPGU) is contained within two bespoke 40 feet shipping containers suitable for installation outside and designed to withstand any climatic conditions, being environmentally controlled internally.

The process container incorporates both intermediate pressure compressors and high pressure hydraulically driven booster compressors, together with gas composition and contamination analysis to ensure consistent test gas quality.

The storage container includes intermediate and high pressure storage together with recovery of defuel gas which is reused for testing to minimise operating expenditure.



HIGH PRESSURE VESSEL LOADING ZONE

Loading the high pressure vessels (HPVs) is achieved automatically via a customised loading zone fitted within a light-guarded area for operator protection.

The HPVs are mounted on bespoke gas test fixtures, which incorporate the high-pressure coupling which automatically mates to the supply coupling within the Leak Test Module (LTM).

The loading zone is designed to accept gas test fixture trolleys either manually located by an operator or by automatically guided vehicles.

Once the trolley is in position, the loading zone transfers the gas test fixture into the leak test module via a bridging conveyor, whilst scanning the gas test fixture for both the high pressure vessel and the component data.



LEAK TEST MODULE (LTM) ACCUMULATION

Leak detection is achieved using forming gas N₂ + H₂ or N₂ + He, via the accumulation method to reduce the costs typically associated with the hard vacuum method.



Leak detection levels of 4e-3 mbar l/s are readily achieved using mass spectrometry.



The LTM incorporates an air recirculation system to guarantee adequate mixing within the leak testing chamber during testing and extraction for fast background cleaning, should a leak be detected.



The leak testing chamber can be exchanged for alternative sizes depending on HPV dimensions to minimise the chamber volume and optimise testing efficiency.



The system is fully interlocked for safety, including building safety features, and all data is captured via a SCADA system for both test component and test data traceability.

LEAK TEST MODULE (LTM) HARD VACUUM

Leak detection is achieved using forming gas N₂ + H₂ or N₂ + He, via hard vacuum method, depending on the leak rate requirements.



Leak detection levels of 10cc/hr are readily achievable using hard vacuum mass spectrometry.



The LTM incorporates a background subtract routine for repeatable, robust leak testing.



The leak testing chamber can be exchanged for alternative sizes depending on HPV dimensions to minimise the chamber volume and optimise testing efficiency.



The system is fully interlocked for safety, including building safety features, and all data is captured via a SCADA system for both test component and test data traceability.

WHO ARE VES?

Vacuum Engineering Services are a specialist company offering leak test solutions to a variety of industries worldwide.

Formed in 1994, we offer unrivalled expertise in helium leak testing. We use our design and manufacturing expertise to provide bespoke leak detection systems that can be found across the world and are actively supported by our worldwide aftersales network.

Our leak test machines are used for guaranteeing leak tightness to very high levels and are used across the automotive, HVAC, fire safety, and nuclear industries. These machines are utilised on production lines in operation 24/7, where reliable results are vital.

SERVICE AND SUPPORT

At VES, ensuring reliable machine performance is key.

We offer full after-sales service through our service department, which provides emergency cover, service contracts and machine upgrades. We also provide service for vacuum systems and other manufacturers' machines subject to inspection.

Our service coordinators organise a highly trained team of engineers to meet our customer's requirements to ensure reliable performance from our machines.

WHO USES VES?



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Interested in our after-sales service?

Call us on
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