

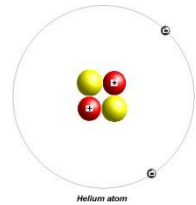
WHY HELIUM LEAK TESTING?



Tightening environmental standards together with increasing functional and safety requirements (to protect the environment, to guarantee high safety standards and product reliability, etc.) drive manufacturers to guarantee leak tightness by completing 100% leak testing as part of the production process.

International quality standards and legislations impose that Helium is used to carry out the leak tests as it represents the only method that guarantees reliable and repeatable results that can be quantified and constantly monitored.

The testing operation can have different level of automation and can be fully integrated in the production line. There are several cost savings and a multitude of benefits that can be attained by using a Helium leak detection system, as explained in the next pages.



HELIUM LEAK TESTING

Leaks can be caused by a number of factors like micro-cracks, porosity, small defects in the welds, defective seals, incorrect components assembly, etc.

Different methods can be used for leak testing:

- Ultrasonic measurement and Bubble test
- Pressure decay
- Helium sniff
- Helium spray
- Helium accumulation
- Vacuum systems



A description of each of these methods is included in the document titled "Leak Testing Methodologies" in the "Downloads & Applications" section of our website.

At Vacuum Engineering we supply Helium based solutions; we can offer a range of different Helium leak test solutions to meet our customers' requirements.

We specialise in Helium leak testing, which, among all, represent the ideal solution for leak testing. This method is characterised by a very high level of sensitivity, quantifiable and reliable results, and the possibility to partly or fully automate the process, integrating it directly into the manufacturing line too if required.

The typical system includes a vacuum chamber where the product is enclosed in to check for any leak point. The air from around the outside is evacuated and Helium gas is introduced inside the product. A highly sensitive mass spectrometer detects the presence of Helium on the outside which would indicate a leak. This technology has the sensitivity to detect leaks which other traditional methods such as pressure decay and the bubble test will not find. To put this into context, industrial Helium leak test machines can detect the equivalent of one tiny bubble every hour, that's the same as a car tire going flat over 2500 years!

Thanks to our recent developments, we can now also offer Helium leak detection systems with no vacuum chamber, based on an accumulation method (AT Machine).

Other techniques can be considered depending on the application and on the customer's requirements.

Vacuum Engineering's designing skills together with the experience and the knowledge gained through more than 17 years, ensures this highly sensitive and technical testing methodology is properly implemented in high quality and robust machines able to work reliably even when part of a high throughput manufacturing line operating 24/7.

For any specific information, please do not hesitate to contact us directly.

TRACER GASES USED FOR LEAK DETECTION

Most of the leak detection machines are based on the use of Helium for the many benefits that it offers:

- Helium is present in the atmosphere in sufficiently low quantities so as not to affect testing (5.2 parts per million)
- Helium is inert, so safe to use for testing. Moreover it's colorless, odorless, tasteless, non-toxic, its boiling and melting points are the lowest among the elements and it exists only as a gas except in extreme conditions. Unlike other tracer gases, residual Helium left in the component will not react with any gas/liquid which the component is charged during its normal operation.
- Helium has a unique mass number (4) enabling mass spectrometers to be 'tuned' to only see Helium
- Helium costs are relatively low - in high consumption processes Helium Recovery Units can be used to obtain high recovery rates
- Helium is naturally occurring in the atmosphere and can be safely discharged without any adverse environmental effects

However, other tracer gases can be used too. Depending on the specific product and application, Vacuum Engineering will offer the most adequate solution to guarantee the best results. Typical examples are the machines we created to test multichannel heat exchangers, where both Helium and Hydrogen are used.

Should you be interested in knowing more about what we can offer for your specific products, please do not hesitate to contact us.

COST SAVINGS AND BENEFITS FOR MANUFACTURERS

Cost savings:

- Environmental liability
- Warranty costs
- Product recall costs
- Product safety & liability costs
- Testing operations related costs (product handling, floor space, labor, time etc.)



Benefits:

- Demonstration of due-diligence
- Conformity with legislation
- Increased efficiency of testing operations
- Higher quality standards (traceability, quantifiable, Competitive advantage against your competitors)



SOLUTIONS WE CAN OFFER

The solutions we offer will always be in line with your technical requirements and financial possibilities:

- from manual to fully automated solutions
- fully or partly integrated in manufacturing line or stand-alone systems
- production rates to suit your needs [our fastest is 100 parts per minute!]
- leak rates as low as 1.0^{-8} mbar·l/s
- test pressure - to suit your needs
- programming software – to suit your needs
- product traceability system (barcode reading/printing, engraving, pin-dot marking, label-printing, data acquisition, data-storage) - to suit your needs
- PLC/PAC types – to suit your needs (typically Rockwell/Allen-Bradley, Siemens, Mitsubishi, Omron, Toshiba, Wonderware/In-Touch)
- connection via modem for remote support



Other options are available which can be discussed directly with the customer. We are open to consider any request and preference for any other options you might desire.

Typical examples of Helium leak testing solutions can be found on our webpage in the “Downloads & Applications” section.