INFICON

Better leak testing

Replace pressure decay testing with tracer gas testing

INFICON – LEAK TESTING EXPERTISE TO SUPPORT YOUR BUSINESS

INFICON tracer gas testing - safe, fast, and economical

GLOBAL MARKETS ARE INCREASINGLY ASKING COMPANIES FOR MORE COST-EFFECTIVE PRODUCTION PROCESSES WHILE SIMULTANEOUSLY DEMANDING HIGHER PRODUCT QUALITY. THIS CHALLENGE REQUIRES INTEGRATED QUALITY TESTING METHODS THAT REDUCE UNIT COSTS AND, AT THE SAME TIME, IMPROVE PRODUCT QUALITY.

Production managers are faced with special challenges in the industrial leak testing sector. On the one hand, requirements regarding the leak-tightness of a component are often not available or not clearly specified. On the other hand, the variety of test methods and their levels of performance are frequently unknown. INFICON's innovative leak testing technology, based on the tracer gas principle, has technical measuring advantages compared to pressure-dependent test methods. Every required quality class has a cost-optimized test method.

Starting points for selecting a suitable leak testing method include the requirements for leak-tightness of the component as well as the stability of ambient conditions in the testing location.

INFICON – YOUR LEAK TESTING PARTNER

- **Close to you** – Worldwide sales and service with highly-qualified application consulting and support
- **Reliable and precise** – More than 100 times more sensitivity than a water test or a pressure decay test. Repeatable even in unfavorable ambient conditions
- **Highly economical** – Low operating costs
- **Large product portfolio** – Leak detectors for helium, hydrogen and final media such as refrigerants, natural gas, gasoline and more
- **Excellent usability** – Simple to use

The leakage rate is the specification for the leak-tightness of a component. This must not exceed the maximum permitted loss of content (operating medium) of a component over the course of its lifetime. As the operating medium does not usually correspond with the necessary tracer gas used for leak testing, conversion to the corresponding gas leakage rate must take place. Empirically determined values are available for components which were filled with fluid.

Leak testing methods which are not particularly dependent on ambient conditions, especially the temperature, are advantageous. Within industrial leak testing, indirect test methods are particularly common; this is where the results are expressed as a leakage rate based on a change of pressure within a component, whereas with direct test methods, the actual gas leakage is measured based on a tracer gas.

LEAKAGE RATES

Requirement	Leak rate [mbar l/s]	Leak rate [sccm]
Water-tight	$< 10^{-2}$	< 0.6
Oil-tight	$< 10^{-3}$	< 0.06
Vapor-tight	$< 10^{-3}$	< 0.06
Bacteria-proof	$< 10^{-4}$	< 0.006
Gasoline-proof	$< 10^{-5}$	< 0.0006
Gas-tight	$< 10^{-6}$	$< 6 \cdot 10^{-5}$
Virus-proof	$< 10^{-7}$	$< 6 \cdot 10^{-6}$
Technically leak-tight	$< 10^{-10}$	$< 6 \cdot 10^{-9}$

Good reasons for your change

1 SAFER AND FASTER TESTING PROCEDURES – DESPITE TEMPERATURE FLUCTUATIONS

Differential pressure tests need stable temperatures. Temperature effects due to air-conditioning systems, drafts and sun, heat radiation from production facilities or fluctuating test part temperatures can be compensated for only to a limited extent and lead to faults in the testing process.

Here the INFICON trace gas method provides a remedy: it measures the leaking gas flow directly so that the temperature effect becomes negligible. Even very hot or cold test parts can be tested without a problem and without delay. A strong case for more efficiency in your testing process.

2 EVIDENCE OF THE SMALLEST LEAKS – EVEN WITH LARGE-VOLUME COMPONENTS

The differential pressure test measures the pressure change in the test part caused by the leak and not the amount of outflowing gas. Drawback: a very small leak in a large-volume component produces hardy any change in pressure and thus is not detected.

Contrast this with the INFICON trace gas method: here the outflowing gas is measured directly. Even the smallest leaks in very large-volume components are detected.

3 REDUCE UNIT COSTS – WITH RECOVERY UNITS

The trace gas testing entails costs for trace gases that, however, you can offset by using a simple recovery unit. In addition, the INFICON measuring technology allows the most minute test gas concentrations, which saves up to 95% of the costs depending on the application.

Last but not least: the differential pressure test also creates costs - for keeping the air clean, drying and compressing the test air.

4 MORE SAFETY – DUE TO THE LOW TEST PRESSURE

Conventional test methods require high test pressures to generate a detectable leak rate despite their low measurement sensitivity. Drawback: faulty and incorrectly attached high pressure lines and defective test parts pose serious risks under high pressure.

The INFICON solution: leak detection devices with low-pressure testing options. This increases the operating safety and lowers your outlays for protective mechanisms and test gas filling.

5 ELIMINATE LEAKS – THROUGH EFFECTIVE LOCALIZATION

With the INFICON trace gas method you locate leaks quickly and precisely - also in connection with pressure-dependent testing or integrated into manual or automated leak testing according to the sniffer method. You can then eliminate the leak, check the success of the repair and return the component to the value-added chain.

6 TESTING OF SENSITIVE OR FLEXIBLE COMPONENTS – WITH TRACE GAS ONLY

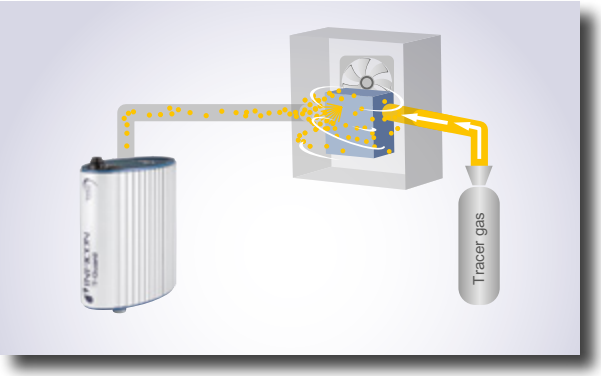
Each pressure-related change in the component's volume follows a change in pressure. This makes the pressure drop testing of flexible or unstable components impossible.

For the purposes of this application, INFICON offers you accumulation leak detection products that detect even the smallest leaks at minimum fill pressures.

A special bonus: The very simple testing methodology guarantees you low investment costs.

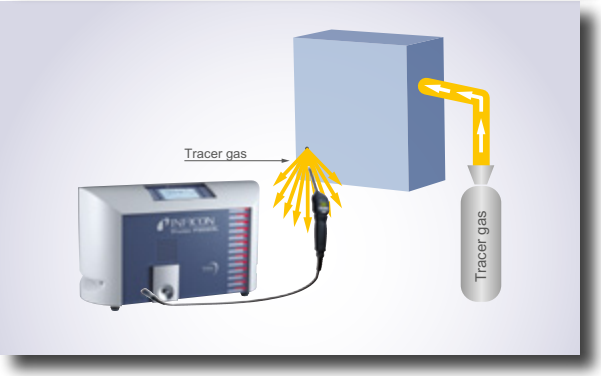
Premium Quality
made in Germany

Tracer gas leak testing methods from INFICON



ACCUMULATION METHOD

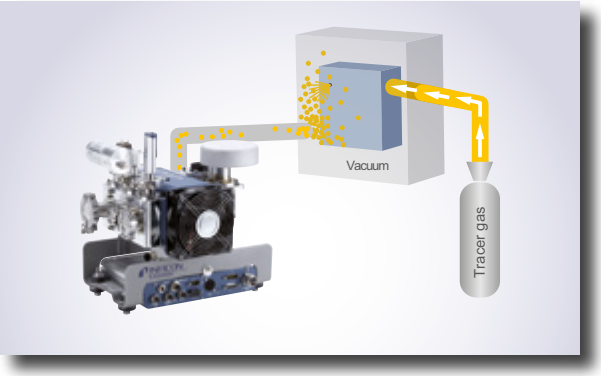
The test component is filled with helium through its test port in an accumulation chamber. Tracer gas which escapes through leaks in the chamber is equally distributed throughout the chamber via fans. The leak detector measures the total leakage rate of the test component regardless of the position of the leak.
As the test takes place under atmospheric conditions, simple and cost-effective chamber systems can be used.



SNIFFER METHOD

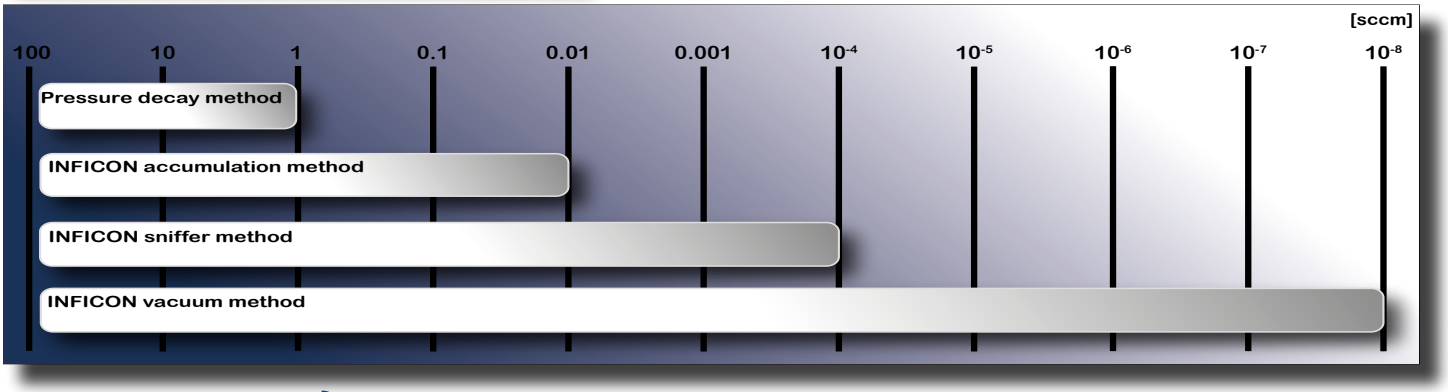
The test component is filled with tracer gas or the operating medium. In case of leaks the tracer gas escapes through the leakage channel and is detected by a sniffer probe. Operation of the probe can either be carried out manually or automatically via a robot.

The advantage of this method is the possibility of pinpointing leaks, which means it is ideal for integral testing processes such as the differential pressure test.



VACUUM METHOD

Generally, the test component is filled with tracer gas in an evacuated vacuum chamber when using the vacuum method. In case of a leak, the tracer gas escapes through the leak channel and is measured by a leak detector which is connected to the vacuum chamber. Leak detection systems in accordance with the vacuum method are characterized by exceptional measuring sensitivity and extremely short measuring times.



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