

A woman with blonde hair tied back, wearing safety glasses and a blue lab coat, is smiling. She is standing next to a piece of industrial equipment. A handheld probe with a digital display is positioned in the foreground, pointing towards the equipment. The background is a blurred industrial setting.

Upgrade your water bath testing

Why tracer gas testing offers you benefits

**LEAK TESTING EXPERTISE
TO SUPPORT YOUR BUSINESS**

Tracer gas testing – safe, fast and economical

IN MANY INDUSTRIES TODAY COMPONENTS, PARTS AND SYSTEMS MUST BE LEAK TESTED. THE LEAK TEST IS INTENDED TO BE EFFICIENT AND EFFECTIVE.

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 set 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 the water bath method. Every required quality class has a cost-optimized test method.

DISADVANTAGES OF THE WATER BATH TEST

- Whether bubbles are detected or not is always dependent on the individual tester. If the test piece has a complex shape or the location of the leak cannot be seen, a tester may not see the bubbles emerge. Even contaminated water can lead to overlooked bubbles.
- The water bath test is often not suitable to actually detect the required leak rate.
- The size of the leak cannot be quantified.

LIMITS OF WATER BATH TESTING



At a leak rate of 0.06 sccm, one bubble per second forms under ideal conditions, but at a leak rate of 0.006 sccm, it takes 30 seconds until a single, small bubble forms.

In reality, the bubbles do not detach from the component surface easily. That is why this method is limited to a leak rate of 0.6 sccm, which severely restricts its potential industrial usage.

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 bath leak test. Repeatable even in unfavourable ambient conditions
- ▮ **Highly economical** – Low operating costs
- ▮ **Large product portfolio** – Leak detectors for helium, forming gas and final media such as refrigerants, natural gas and more
- ▮ **Excellent usability** – Simple to use

LEAK 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	$< 10^{-6}$	$< 6 \cdot 10^{-5}$
Technically leak-tight	$< 10^{-10}$	$< 6 \cdot 10^{-9}$

Benefits of switching to the tracer gas method

1 THE TRACER GAS METHOD SAVES TIME AND REDUCES COSTS

A bubble test is fast and cost-effective, but on closer inspection several drawbacks become evident. After the water bath, the wet test part must be dried, which takes time and costs money.

The water in the test tank must be changed on a regular basis. If chemicals are added, the tank contents must be disposed of each time as hazardous waste.

The INFICON tracer gas method is completely different. It gets the job done without water, chemicals and associated expenses. Tracer gas testing does involve costs for the tracer gases, but these can be offset for the most part by using a simple recovery unit. In addition, INFICON measuring technology allows the most minute test gas concentrations, which saves up to 95 % of the gas costs, depending on the application. If the tracer gas method is integrated directly into the line, there is no complicated routing between production and the test tank. Finally, tracer gas testing reduces your warranty costs as even the smallest leaks are found quickly and reliably.



2 GREATER OPERATIONAL SAFETY WITH THE TRACER GAS METHOD

Since the tracer gas method does not require water and chemicals, there are no health and safety hazards associated with wet, slippery workplaces contaminated with hazardous substances. In addition, the tracer gas method eliminates the need for monotonous work processes that put significant strain on worker's eyes. The INFICON tracer gas method is the top choice for workplace safety and ergonomics.

3 TRACER GAS METHOD – RELIABLE AND ACCURATE

The bubble test detects leaks that generate an easily visible flow of bubbles (up to 3 sccm). In order for just one bubble to emerge, the test part must remain in the water bath for quite some time with smaller leaks.

One problem that should not be underestimated, is the inspector's clear view of the test part and bubbles. A test part with complex shape, a leak location that is not readily visible or dirty water can make it impossible for the inspector to see leaking bubbles.

The INFICON tracer gas method provides an effective solution for identifying even the smallest leaks quickly and reliably. Inaccurate leak testing and overlooked leaks are now a thing of the past.

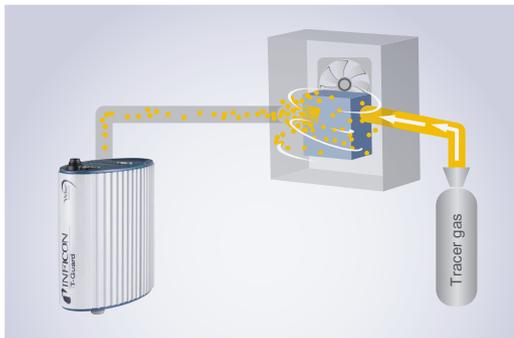
4 THE TEST GAS METHOD IS SUPERIOR TO SOAPING

Soaping, which involves spraying with a soaping liquid, and the water bath method are closely related. Both methods require an inspector to observe a bubble formation which is highly dependent on the inspector's skill and performance on any given day. The test piece must not only be dried but also be cleaned. In addition, with the soaping method smaller leaks are not detectable.

The INFICON tracer gas method is the better alternative to soaping.



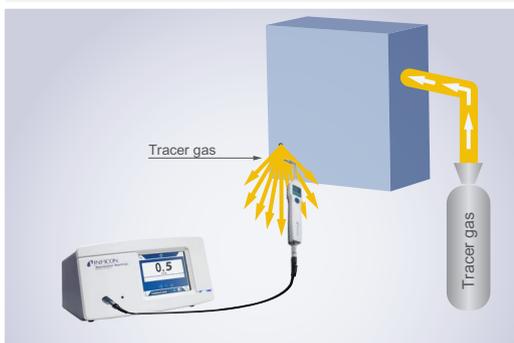
Tracer gas leak testing methods from INFICON



ACCUMULATION METHOD

The test component is filled with tracer gas 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.

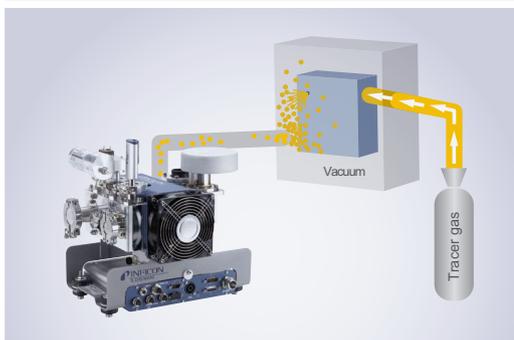
As the test takes place under atmospheric conditions, simple and cost-effective chamber systems can be used.



SNIFFER METHOD

The test component is filled with tracer gas or the operating medium. In case of leaks the tracer gas will escape and will be detected by a sniffer probe. The probe can be operated manually or automatically by a robot.

This leak testing procedure can even be performed after a water bath test to confirm and pinpoint leaks.



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 there and is measured by a leak detector which is connected to the vacuum chamber. Leak detection systems that use the vacuum method are characterized by exceptional measuring sensitivity and extremely short measuring times.

