

# We'll Help You Find The **Best Leak Test**

WELCOME TO THE **LARGEST LEAK TESTING PORTFOLIO** IN THE INDUSTRY



[cincinnati-test.com](http://cincinnati-test.com)

**cts** CINCINNATI  
TEST SYSTEMS

Your Global Leak and Function Test Solution Experts



Cincinnati Test Systems (CTS) is a world leading designer and manufacturer of standard and custom leak test systems and leak detection equipment. We've gained loyal customers all around the world by providing engineered leak detection equipment, leak test instrumentation, and air flow devices that operate accurately and reliably.

### TASI TEST AND AUTOMATION



Cincinnati Test Systems' partnership with Sciometric, innomatec and Sierra CP provides our customers with the industry's most comprehensive test portfolio. Manufacturers worldwide can lever the combined products and expertise of Sciometric, CTS and innomatec for leak test and other in-process test solutions for the manufacturing line through one cohesive sales and support team.

## Industries we specialize in



Automotive



Consumer electronics



Medical



Appliances and consumer goods



Military and defense



Energy



HVAC/R



Other transportation



eMobility

## Test Solutions / Technologies

Cincinnati Test Systems (CTS) designs and manufactures the industry's most technically advanced, best-performing leak test systems, leak detection equipment, tracer gas systems, helium reclaim equipment, and related components.

From benchtop leak test devices to custom-engineered solutions, CTS has the right technology for your testing requirements.

Pressure Decay

Vacuum Decay

Flow

Functional Test

Tracer Gas

Helium Recovery

Large Part Leak Testing

IPXX Leak Testing

## Pressure decay is a highly effective leak test method

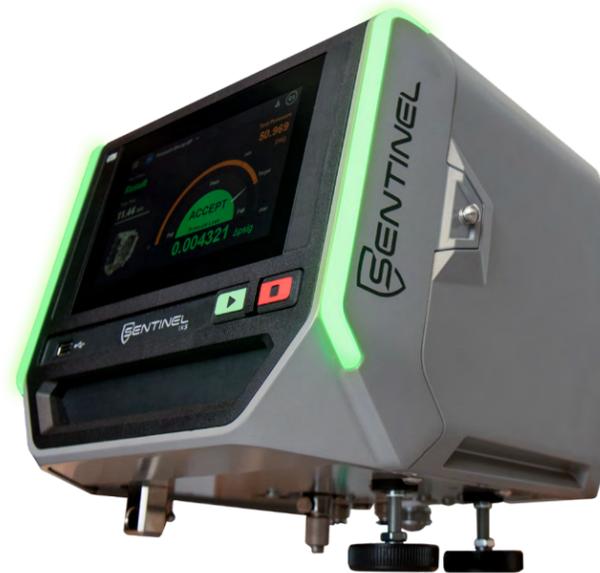
Pressure decay air leak testing monitors the internal pressure of a part. The part is filled to a preset test pressure. Then pressure loss is measured over a specific time to indicate that the part is non-leaking or has a leak above specification. The sensitivity of pressure decay testing depends on the total volume of the part being tested, as well as the test time and the resolution of the pressure transducer. In general, this testing method is easier to perform than many other processes for leak rates as low as 10<sup>-2</sup> scc/s.

### BENEFITS OF PRESSURE DECAY LEAK TESTING

- Sensitive enough to detect very small leaks
- Can test in pressure or vacuum environments
- Determines a leak rate based on pressure or vacuum
- Can be calibrated to a volumetric flow
- Can report pressure or flow loss (psig or scc/min)
- Provides a simple and highly effective leak test method

### TYPES OF PRESSURE DECAY TESTING

- Traditional pressure decay
- Differential pressure decay
- Sealed device leak test
- Occlusion
- Proof test
- Burst test



Sentinel IX5

## Vacuum decay is a simple, highly repeatable leak test method

Vacuum decay testing is essentially the opposite of pressure decay testing. Instead of pressurizing the part, it is evacuated and monitored for any increase in pressure caused by test media entering the part. Vacuum decay air leak testing is more sensitive and precise than pressure decay testing and is less affected by temperature changes or other environmental factors. However, the pressure difference applied to the part during test cannot be greater than 14.7 psiv.

### PRIME CANDIDATES FOR VACUUM LEAK TESTING INCLUDE:

- Underwater sensors or housings
- Outdoor electrical housings
- Sealed components
- Components associated with vacuum sources



CTS offers sealed device leak testing with IP rating specifications. Your business' product quality, warranty cost and overall reputation all depend on your ability to ensure your sealed components are sealed from contamination or leakage. CTS offers a highly accurate solution for leak testing your sealed components, allowing you to focus your valuable attention elsewhere.

## Mass flow is ideal for testing small parts with high leak rates

Mass flow systems measure the volumetric flow of air passing into or through a product per unit of time. During flow testing, pressure is held constant. If the flow rate is above the predetermined leak rate, a leak is present.

Flow testing is ideal when testing a small part with a high leak rate and when part to part volumes are not consistent. In these cases, flow testing increases accuracy and repeatability as compared to traditional pressure decay testing.

Flow testing is used for the leak testing, blockage (occlusion) testing and functional testing of devices.

### TEST TYPES

- Mass flow
- Mass flow leak standard
- Functional flow testing



## Functional testing is critical to ensure product quality

Functional testing is utilized to measure the performance of complex assemblies. A functional test system applies force and power to the part under test to measure its output compared to its tolerance to ensure that it performs within its specification.

CTS' expertise crosses multiple business sectors, allowing us to provide customers with test solutions designed for their specific market or application. We offer a variety of integrated technologies including:

- Equipment calibration systems
- Flow testing solutions
- Fluid and air burst test systems
- Hydrostatic leak test systems

Tools integrated in CTS functional test systems are certified for National Instruments and Sciometric sigPOD/QualityWorx.



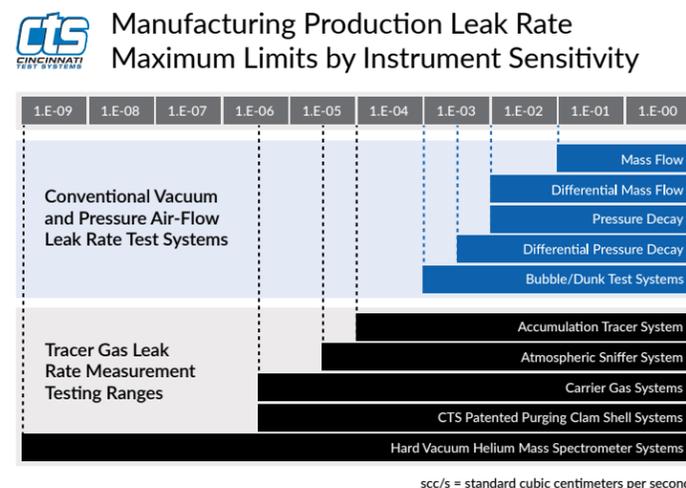
# Tracer gas leak testing finds micro-leaks in the range of $1 \times 10^{-2}$ to $10^{-9}$ scc/s

Tracer gas leak testing is a simple and highly-efficient method of leak detection that provides high sensitivity, accuracy, and repeatability. A tracer gas leak test is used to test parts with very low leak rates that are outside the range for conventional air-flow pressure decay and mass flow testing, and to replace bubble test methods.

## BENEFITS OF TRACER GAS LEAK TESTING

- Leak location
- Enhanced sensitivity and resolution for increased leak test accuracy
- Capability to detect micro-leaks down to  $1 \times 10^{-9}$  scc/s
- Faster test times than air-flow leak testing technology
- Non-temperature dependent test accuracy
- Significantly reduces false leak failures

The chart to the right shows the different sensitivities for air leak testing vs various types of tracer gas testing:



## Types of Tracer Gas Testing

### HELIUM SNIFF/FORMING GAS TESTING

Helium sniff/forming gas testing not only locates the leak point, it is also highly sensitive (as low as  $10^{-5}$  scc/s). However, as it generally requires manual operation, it offers slower throughput than some other air leak testing methods, and its effectiveness is limited in environments where background air flow reduces the concentration of tracer gas or in areas where there is a high concentration of helium near the test site.

### HELIUM SPRAY TESTING

Helium spray air leak testing can accurately locate a leak and is highly sensitive (down to  $10^{-6}$  scc/s). However, multiple leaks may be "masked" if they are located too close to each other, and throughput is generally low.

### HELIUM/FORMING GAS ACCUMULATION TESTING

Helium/forming gas accumulation leak testing offers good sensitivity (down to  $1 \times 10^{-4}$  scc/s, depending on enclosure size), high reliability, and good repeatability, and is not susceptible to temperature.

### NITROGEN PURGE TESTING

CTS' patented nitrogen purge testing instrument is a localized, sniffer-style tester with superior background control that reduces the chances of false leak failures. Our nitrogen purge testing technology can detect leaks as low as  $10^{-6}$  scc/s.

### HARD VACUUM TESTING

Vacuum testing is extremely sensitive (down to  $10^{-8}$  scc/s), highly repeatable, and provides reliable and quantifiable results. It can be fully automated and integrated into a production line for fast throughput.

### HELIUM RECOVERY REDUCES TRACER GAS COSTS

Helium recycling systems are perfect additions for large parts and high pressure tests with high throughput production rates where large amounts of helium are used. Helium reclaim systems reduce helium tracer gas costs by recycling the helium for reuse in your plant.

Our popular, high performance family of leak detection instrumentation includes a range of solutions that makes it easy to find the right leak test device for your unique needs



### SENTINEL BLACKBELT PRO

The Sentinel Blackbelt Pro™ is an advanced multi-test, multi-port, multi-channel test instrument for leak, flow pressure and vacuum testing. One Blackbelt Pro instrument can manage and execute 4 individual part tests at different stations. It offers the flexibility of a custom instrument in a standard benchtop or wall mount instrument platform.



### SENTINEL BLACKBELT

The Sentinel Blackbelt is the industry's most versatile single-channel, benchtop pressure decay, mass flow leak and blockage tester. One instrument can perform multiple tests to reduce cost and complexity. A top choice for testing disposable medical devices, industrial and medical lab settings.



### INTRODUCING SENTINEL IX5

The Sentinel IX5 is a next-generation, multi-functional leak and flow test instrument offering precision, flexibility, and advanced performance. Designed as a single-channel solution, it builds on the capabilities of existing Sentinel instruments while introducing new and improved features to meet evolving testing demands. With its intuitive touchscreen interface, re-engineered user experience, and configurable wall-mount options, the Sentinel IX5 streamlines operation and integrates seamlessly into diverse applications, delivering unmatched testing efficiency.



### SENTINEL I28

The Sentinel I28 is a workhorse instrument supporting mass flow, pressure decay, differential pressure decay, and occlusion testing technologies. It is easily integrated onto a test system for supporting a turnkey testing approach.



### SENTINEL C28

The Sentinel C28 is a versatile and highly advanced leak test instrument that provides high-resolution pressure decay, vacuum decay and occlusion leak testing with speed and repeatability in a compact wall-mount design.



### SENTINEL MH

The Sentinel MH instrument is perfectly designed for integration into automated test systems. Its compact design and high-resolution measurements are matched with functionality of pressure decay, mass flow, or high speed pressure measurement for any automated production line.



### SENTINEL C20

The compact wall-mount Sentinel C20 World Edition instrument is the industry's most cost-effective pressure decay leak test instrument. Designed with the same technology as all Sentinel instruments, the C20 is known for accuracy, speed, and repeatability. The C20 is known for its simplicity, accuracy, and repeatability.



### TRACERMATE II

The TracerMate II is a leak test and tracer gas management instrument that works with a mass spectrometer or gas analyzer to detect very small leaks by measuring for a concentration of helium or hydrogen gas escaping from a sealed part. Ideal for manufacturers in transportation, HVAC, appliances and industrial markets, when part types and leak rates mean that standard pressure or flow technologies aren't appropriate.



### SENTINEL LPC 528

The Sentinel LPC 528 leak test instrument is characterized by excellent measuring accuracy, simple, intuitive operation, and durability. It is the benchtop version of the Sentinel C28, offering standard pressure decay/vacuum decay technology. It has been upgraded with additional functionality of differential pressure decay or mass flow technology, while being integrated using PROFINET or Ethernet/IP."



### SENTINEL 3520

The Sentinel 3520 is a pressure decay and mass flow instrument particularly suited to large parts such as EV batteries, variable volume parts, and parts requiring temperature and other compensation—all while delivering speed, accuracy, and repeatability. This instrument offers advanced configurability using CTS partner company Sciemetric's digital signature analysis software.

CTS integrates the right technology into a custom manufacturing station that does exactly what you need it to.

**CUSTOM MACHINE HIGHLIGHTS:**

- Single and multi-station configurations
- Progressive fixturing
- Automated part testing capability
- Semi-automated and fully automated part load
- Automated part clamping and port sealing
- Integrated CTS leak test instruments
- Programmable Logic Control sequencer
- Industrial frame with safety interlocks
- Efficient and compact modular designs

Here's an example of CTS custom capabilities:



# Get a reliable, long-lasting seal with a **CTS Connect!**

Manufactured with proprietary seal materials, our quick connectors and pneumatic fittings are made to resist wear and are resistant to all types of fluids and chemicals. Patented designs also reduce wear to increase the life of the seal. Used in many applications from vacuum pressure to 2500 psig—such as leak testing, filling, cleaning, burst testing, pressure testing, flushing, charging systems, proving integrity, and part handling.

**Air actuated seals**



**Internal Diameter Seals**

The CI, or “connect inside” standard products seal the internal diameter of a part. They feature patented stroke-limiter technology to limit wear.



**Outside Diameter Connectors**

CO “connect outside” standard products provide an external seal to a part. Unique set screw design ensures a repeatable seal.

**Hand sealed, manual pneumatic connectors**



**Inside Diameter Manual Actuated Seals**

Easy to use, the CTS Connect HI range of seals are available with and without grip handles.



**Outside Diameter Manual Actuated Seals**

Used to seal the outer diameter of a part and allow for filling or pressurizing through the fill port.

**CUSTOM PNEUMATIC SEALS AND COMPONENTS**

To fit your irregularly shaped seal surfaces, we also custom-manufacture specialty pneumatic and hand-operated seals and pneumatic connectors. CTS excels at providing customized designs for the most unique sealing applications and offers seal materials in various levels of hardness and tensile strength to meet your requirements.

## Cincinnati Test Systems provides certified, high performance air flow leak standards and tracer gas leak standards

Our leak standard units are precision manufactured to match your unique flow and pressure requirements. All leak standard calibration is performed in-house in our A2LA accredited and ISO 17025 certified lab. We provide an NIST-traceable calibration certificate with every leak standard.

### Air Flow Leak Standards and Tracer Gas Standards

#### AIR FLOW LEAK STANDARDS - ISO 17025

We manufacture our air flow leak test standards (figure 1) to precision tolerances based on your specific flow and pressure requirements. These certified leak orifices mount into master calibration parts or plug into test lines and manifolds for calibration processes.

#### TRACER GAS LEAK STANDARDS

Options for tracer gas leak test standards (figure 2) include sniffer leak test standards, vacuum leak test standards, and sniffer and vacuum compatible standards.



Figure 1

Figure 2



### LEAK STANDARD RECERTIFICATION SERVICE

Cincinnati Test Systems offers Leak Standard Recertification for most commercially manufactured leak standards. If you calibrate your leak test to a leak standard, it must be certified annually to provide the flow rate at a specific test pressure. CTS will check your leak master and provide a certification of calibration with its current readings from our accredited lab at the CTS factory.

## Service and Support

### Ensure Optimized Test Performance with CTS Services

CTS offers services to maintain consistent and reliable performance of your test systems and equipment. Designed to support your plant and minimize the impact of downtime, many of these services are offered either at our factory or on-site. From annual recalibration and maintenance to training on how to get the most out of your CTS solution, we help ensure you continue to manufacture quality parts.

#### INSTRUMENT CALIBRATION SERVICES

CTS performs precision pressure calibration and flow calibration of every one of our leak test instruments during the manufacturing process. However, for many users, annual instrument recalibration is required to keep their quality standards up-to-date and to ensure that the parts they ship meet specification. We offer factory and on-site calibration services and all instruments are calibrated to A2LA Accuracy standards.

#### Other Services Offered:

- Preventative maintenance programs
- Factory and on-site CTS customer training
- Replacement of industrial seals



## Why Choose CTS?

Cincinnati Test Systems (CTS) offers the industry's largest portfolio of advanced leak testing solutions, including pressure decay, mass flow, and tracer gas methods. Backed by 40+ years of expertise, CTS provides precision, reliability, and world-class support to optimize your production processes. We'll help you find the best leak test. **Learn more at [www.cincinnati-test.com](http://www.cincinnati-test.com).**

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### CINCINNATI TEST SYSTEMS

Corporate Headquarters  
10100 Progress Way,  
Harrison, OH 45030

513.367.6699

[www.cincinnati-test.com](http://www.cincinnati-test.com)