

# Ultra-Precise Flow Data Raises the Bar for Leak Test Standards

ULTRA

HIGH

MEDIUM  
HIGH

STANDARD

**O'Keefe Controls Co.**

*If it's about precision, it's O'Keefe.*



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## Leak Detection: An Industrial Necessity

A wide variety of industries require that products are produced leak free. To name a few: manufacturers of lead acid batteries, engine components, drive trains, offroad and ATV components, consumer appliances and medical devices. All have applications that have stringent leak-free requirements. These requirements are established by company or industry best practice, in response to regulatory directives such as the Clean Air Act, or by industry group-accepted standards such as in the medical device realm.

In response to these demands, a multitude of manufacturers have developed leak detection equipment. Solutions range from visible bubble generation on pressurized submerged test samples, to pressure decay, mass flow or carrier gas detection. Each technology has features and benefits which make them ideal for specific applications; each method also has drawbacks. Bubble detection is extremely sensitive to leaks but can be messy and relies heavily on experienced operators. Electronic results are difficult to capture. Other methods can provide electronic signals and data gathering for analysis. Methods that use pressurized air are clean and easy to work with.

***Leak testing various components  
is critical during automotive engine  
manufacturing.***

## Ensuring Accurate Results in Leak Testing

Modern leak test equipment is generally accurate and reliable but how can we instill confidence in the output? How is the leak detection equipment periodically verified for proper operation? The answer is a *leak rate standard*, otherwise known as a precision orifice. Precision orifices are apertures designed to restrict the flow of air, water, or other fluids. Often circular in shape, precision orifices have tightly controlled diameters, lengths, and inlet and outlet geometries. In some cases, flow rates can be specified instead of orifice diameter allowing the user to customize a precision orifice to best suit their application. This can be particularly important when specifying test standards for leak testing applications.

## Precision in Flow Data Allows Greater Accuracy in Testing

While all precision orifices are “precise” by definition of basic mechanical characteristics and function, there exist degrees of manufacturing quality, and quality control, that vary by manufacturer. Accurate flow data is necessary to specify a precision orifice properly for an application. In meeting the challenge of testing and verifying leak test equipment, known flow data can be especially critical. Let us look at a few different scenarios which illustrate an increasing demand for accuracy.

**To ensure safety, a gas detector is commonly installed near a gas compressor to detect any leakage.**





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## Scenario 2

### Precision flow data is provided for a specific standard orifice

In cases where a greater degree of accuracy is desired, more precise flow data than that found on standard flow charts can be provided for a specific orifice. In this case, the specific orifice can be flow tested at the customer's test conditions, and a unique data set provided.

A precision orifice manufacturer with the capability of providing a flow calibration for a specific precision orifice, with flow and pressure measurement that is traceable to a NIST standard, offers a distinct advantage — and a viable solution — to such customers. **O'Keefe Controls Co.** offers this specialized service for their **Precision Metal Orifices**, **Precision Sapphire Orifices**, and **Precision MICRO- ORIFICES®** lines of products.

*Leak testing is vital in Pharmaceutical Packaging to ensure product purity and freshness.*



*O'Keefe Controls Co. Precision Metal Orifices are used in leak testing applications across many industries.*





## Scenario 3

### Precise flow and tolerance data is provided for extremely small orifice sizes

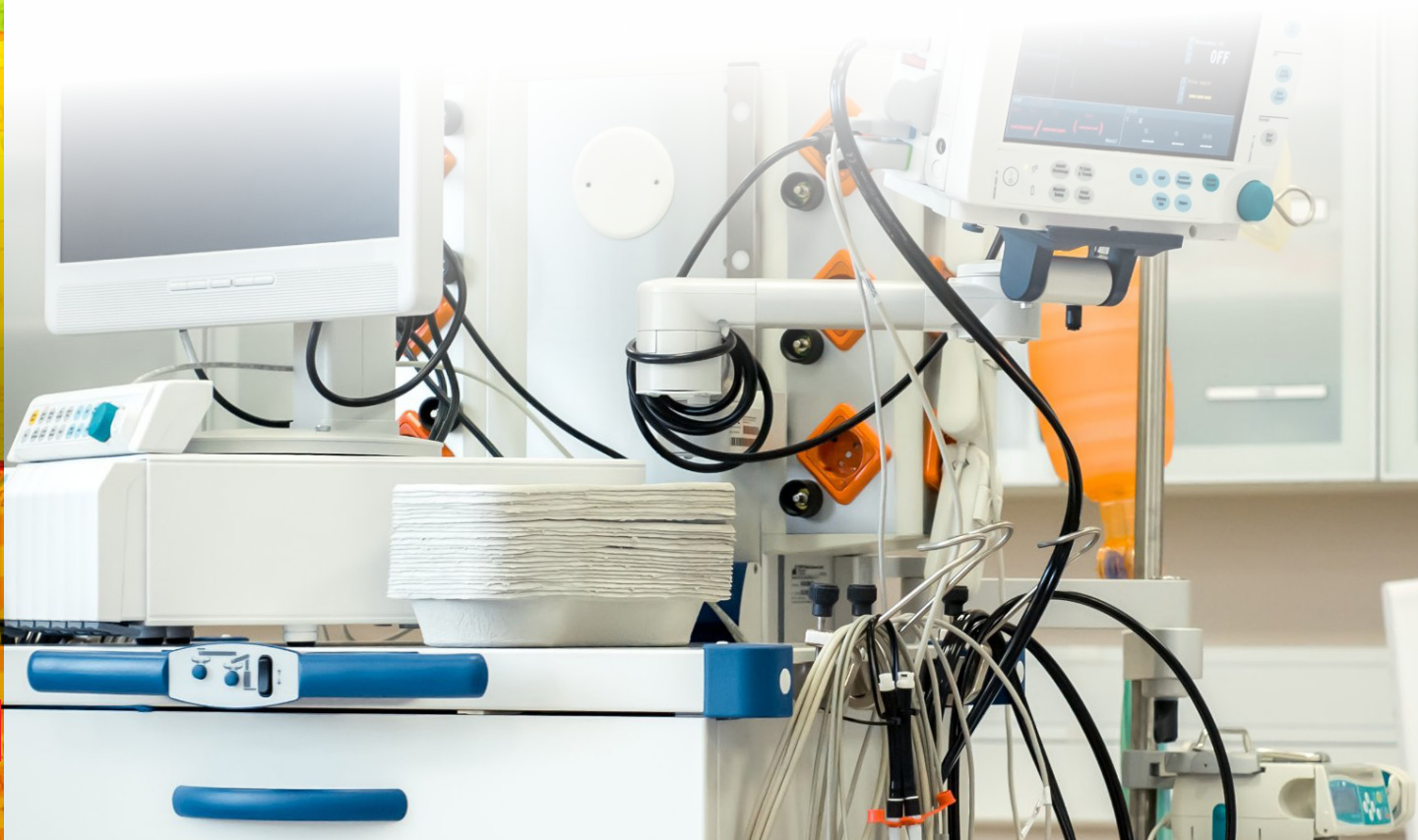
When simulating exceptionally low leak rates, it is necessary to work with orifice diameters below .001". When working within this range, accurate known flow and known tolerance data is essential to create a leak standard. **O'Keefe Controls Co. Precision MICRO-ORIFICES®** line of products are a commonly specified solution, for just this reason. Chart data with flow tolerances is provided for each orifice diameter and type.

Offered in incremental nominal sizes between 0.0003 – 0.005 inches in diameter, these **Precision MICRO-ORIFICES®** can be provided with flow and pressure data which is taken on NIST-traceable instrumentation. In other words, at a specified range of pressure conditions, customers are provided with the specific flow data for their particular orifice, and they are advised what the relevant flow and pressure measurement accuracies are.

Receiving such "ultra-precise" data allows an unprecedented level of confidence in product performance. As such, **Precision MICRO-ORIFICES®** with their corresponding data sets fulfill a vital need in certain industrial applications.



**O'Keefe Controls Co. Precision MICRO-ORIFICES®** are commonly used for medical equipment applications.



## Scenario 4

### Custom solutions in Leak Standards

In certain applications, off-the-shelf leak standards are not sufficient to meet regulatory requirements, or requirements specified by the user. In cases like these, it is possible that a custom flow rate leak standard can be provided. Inlet and outlet pressure conditions, the required nominal flow rate, the flowing gas, and the Standard Conditions need to be specified. When this is the only viable solution, **O'Keefe Controls Co.** has the capability of offering a custom flow rate **Precision Metal Orifice**, or a custom flow rate **Precision MICRO-ORIFICE®**, along with its corresponding data set.

### Summary

Leak detection is essential in many industrial applications. Ensuring that the equipment used for leak testing is functioning properly to an established, acceptable threshold is just as vital. Precision orifices, along with their flow data, can provide an accurate, reliable method for testing leak detection devices. As accuracy requirements increase in leak verification, it is essential that extremely precise, accurate data be provided.

As a leading manufacturer of precision orifices, **O'Keefe Controls Co.** is unique in its ability to provide flow data for each of its impressive array of precision orifices. During manufacturing, the orifices themselves undergo rigorous quality testing to ensure flawless accuracy and repeatability, batch after batch. As an ISO9001-2015 registered enterprise, the manufacturing processes are subject to stringent quality control measures in an effort towards continuous improvement. With regards to leak testing, these factors allow engineers to select precision orifices with unwavering confidence in their performance.

**O'Keefe Controls Co.**

*If it's about precision, it's O'Keefe.*

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*Leak testing is critical in the production of lead acid batteries.*

