



## Leak Checking a GC System

### A Leak Free System Will Allow Greater Sample Throughput and Less Downtime

By Tom Bloom, International Technical Support Manager

All too often, analysts tell us “I’m sure I don’t have any leaks in my GC system.” But what tool will allow you to be confident that your analytical system truly is leak free? We strongly encourage every analyst to incorporate electronic leak detection into their daily routine, to improve analytical performance, minimize troubleshooting, and prevent damage to columns and sensitive detectors. Think of leak checking as critical preventative maintenance, and good laboratory practice, that you can’t afford NOT to do. Keep in mind that leaks can cause significant losses of expensive high-quality gas, shortened trap and purifier lifetimes, increased column bleed, and increased system and detector maintenance. Furthermore, some detectors, such as ECDs, can be severely damaged by exposure to oxygen through system leaks.

You can avoid or minimize many problems by leak checking the complete analytical system, not just the chromatograph, during the plumbing process and periodically thereafter. Unlike in HPLC systems, where leaks are apparent, leaks in GC systems can be subtle and difficult to isolate without proper equipment. Therefore, we recommend leak checking the system before beginning the column conditioning cycle and eliminating all leaks before proceeding with column conditioning and analytical work.

- Begin at the carrier gas source and regulator and carefully check each fitting and connection along the pathway to the GC.
- Turn off the oven fan and check all fittings, adaptors, and connections inside the oven as well.
- Don’t forget to check all column and guard column connections, such as connectors or unions as well—often a leak can be traced to a column end that was crushed during installation.

The best way to leak-check a capillary column system is to use a thermal conductivity leak detector, such as the Restek Electronic Leak Detector (cat.# 28500). This portable, reliable, and relatively inexpensive handheld device detects minute traces of helium or hydrogen carrier gas without contaminating the system. Leaks in a GC/mass spectrometer (MS) system can be determined by monitoring for mass 28 (nitrogen) or 32 (oxygen), or by spraying argon gas around fittings and connections and monitoring for mass 40.

Note that we strongly recommend you never use liquid leak detectors that contain soaps or surfactants in capillary chromatography. Leaks draw these materials into the system (via the Venturi effect), where they contaminate the column, making high sensitivity operation difficult. In addition, liquid leak detectors can cause permanent damage to the stationary phase.

In summary, every GC laboratory should have access to an electronic leak detector and all analysts should be trained to use this tool every time a new column or fitting is installed, a cylinder is changed, or instrument troubleshooting is indicated. To minimize the possibility of damaging your column and detector, NEVER condition a column without leak checking the system first! Remember: a leak-free system will allow greater sample throughput and less downtime in the long run!



28500

## Restek Electronic Leak Detector

New and improved! Prevent small leaks from causing big problems with a Restek leak detector.

- Detects a broad range of gases and indicates leak severity with both an LED display and audible tone.
- No more waiting for a full charge—can be operated during charging or used up to 12 hours between charges.
- Charging kit includes both universal AC power adaptor and USB charging cable so you can charge anywhere, anytime.
- Pinpoint very small gas leaks quickly and accurately before they cause damage and downtime.
- Compact, handheld unit is easy to operate and convenient to use anywhere you need to check for leaks.

### Features & benefits include:

- Detects a broad range of gases.
- Audible tone and LED display indicate the severity of a leak.
- Can be operated during charging or used up to 12 hours between charges.
- Ergonomic, handheld design.
- Rugged side grips for added durability.
- Handy probe storage for cleanliness and convenience.
- Automatic shutoff.
- A convenient carrying and storage case.
- Easy-to-clean probe assembly.
- A universal AC power adaptor (U.S., UK, Europe, Australia, Japan).
- USB charging cable.

Backed by a one-year warranty, the Restek leak detector is the industry standard for performance and affordability in handheld leak detectors.

<p><b>Leak Detector Specifications</b>          Detectable Gases: Helium, nitrogen, argon, carbon dioxide, hydrogen*          Battery: Rechargeable nickel-metal hydride (NiMH) internal battery pack (12 hours normal operation)          Ambient Temperature: 50–98.6 °F (10–37 °C)          Humidity Range: 0–97%          Warranty: One year          Certifications: CE (EU, Korea, Japan, Australia)          Compliance: WEEE, CEC, China RoHS 2          Indoor Use Only</p>	<p><b>Limits of Detection</b>          These gases can be detected with the Restek electronic leak detector at the following leak rates:          Minimum Detectable Gas Limits and Indicating LED Color:          Helium, <math>1.0 \times 10^{-3}</math>, red LED          Hydrogen*, <math>1.0 \times 10^{-5}</math>, red LED          Nitrogen, <math>1.4 \times 10^{-3}</math>, yellow LED          Argon, <math>1.0 \times 10^{-4}</math>, yellow LED          Carbon dioxide, <math>1.0 \times 10^{-4}</math>, yellow LED          Gas detection limits measured in atm cc/sec.</p>
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Description	Certification/Compliance	Includes	qty.	cat.#
Restek Electronic Leak Detector	CE (EU, Korea, Japan, Australia), WEEE, CEC, China RoHS 2	carrying case, universal AC power adaptor [U.S., UK, Europe, Australia, Japan], 6-ft USB charging cable	ea.	28500

Avoid using liquid leak detectors on a GC! Liquids can be drawn into the system and/or into the leak detector.

\*Caution: The Restek electronic leak detector should only be used to detect trace amounts of hydrogen in a noncombustible environment. It is NOT designed for determining leaks in a combustible environment. A combustible gas detector should be used for determining combustible gas leaks under any condition. When using it to detect hydrogen, the Restek electronic leak detector may only be used for determining trace amounts in a GC environment.

If your Restek electronic leak detector needs service or repair, send a completed Health and Safety form and SRV-GC Accessories form to Restek Returns. Failure to provide all required information may lead to significant processing delays. Once we have received both completed forms, we will provide authorization and instructions for returning your unit; do not send any equipment back to Restek prior to receiving authorization. Leak detector service (cat.# 22655-R or 28500-S) includes inspection, battery replacement (if necessary) and testing of the unit.

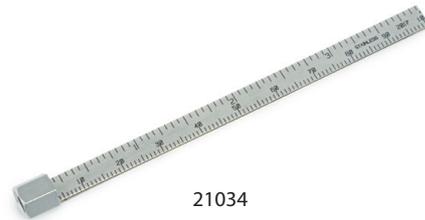
### Capillary Installation Gauge

for Agilent, Thermo 1300/1310, and Perkin Elmer 590/690 GCs

- Seats graphite\* ferrules onto column for consistent installations.
- Prevents crushed column ends.
- Made from high-quality stainless steel.

Description	Instrument	Used with	qty.	cat.#
Capillary Installation Gauge	for Agilent, Thermo 1300/1310, and Perkin Elmer 590/690 GCs	for 1/16" fittings (1/16" ferrules)	ea.	21399
	for Agilent, Thermo 1300/1310, and Perkin Elmer 590/690 GCs	for Agilent-style fittings (compact ferrules)	ea.	21034

\*For use with graphite ferrules only.



21034

Easily seat ferrules for consistent installations!

### Capillary Installation Gauge

for Agilent 5973/5975/5977 MS

- Seats ferrules onto column for consistent installations.
- Made from high-quality stainless steel.

Note: Do not use on a 5975/5977 MS with an EI source (inert or SS). Doing so will extend the column too far into the ion source. This installation gauge is compatible with the 5975 MS with a CI source and the 5977 MS with the extractor or high-efficiency sources.

Description	Instrument	qty.	cat.#
Capillary Installation Gauge	for Agilent 5973/5975/5977 MS	ea.	21894



21894

### Ceramic Scoring Wafer

Eight straight edges for cutting both fused silica and metal MXT tubing.

Description	qty.	cat.#
Ceramic Scoring Wafers	5-pk.	20116



20116

### Sapphire Scribe

- Cuts fused silica tubing.
- Produces a clean, square cut.

Description	qty.	cat.#
Sapphire Scribe	ea.	20182



20182



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**Lit. Cat.# GNAR3221-UNV**