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What's
NEW?
look for this
circle

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NEW Restek ProFLOW 6000 Electronic Flowmeter**State-of-the-art features include:**

- Measures volumetric flow for gases across a range of 0.5-500 mL/min.
- NIST traceable calibration.
- Ex rating (electrical apparatus for explosive gas atmospheres) for hydrogen and related gas types.
- Accuracy of $\pm 2\%$ of flow or ± 0.2 mL/min., whichever is greater.
- Over range warning indicator.
- Auto shut-off feature.
- Use as a bench-top or hand-held unit.
- Ergonomic design and side grips for comfort.
- Measures most gas types.*
- Convenient carrying/storage case included.
- Uses 2-AA batteries (included).
- Data output via USB port.
- 1-year warranty.
- Recalibration service available.

Flowmeters that can measure flammable gases are becoming mandatory, due to the increased use of hydrogen in chromatography. With its Ex rating, the Restek ProFLOW 6000 Flowmeter is designed specifically with explosive and flammable gases in mind.

The new Restek ProFLOW 6000 is the only flowmeter you need for any type of chromatography gas measurement because of its wide range of capabilities. The ProFLOW 6000 is an electronic device capable of making accurate time measurements can be made for changing gas types. This portability adds bench-top convenience.

Flowmeter Facts:

Type of flowmeter:	volumetric
Battery:	2AA
Operating Temp. Range:	32-120°F (0-48°C)
Warranty:	one year
Certifications:	CE, Ex
Compliance:	WEEE, RoHS

SUPPLIES & ACCESSORIES



22657

Optional soft-side storage case is ideal for storing your flowmeter in smaller spaces, such as your tool box.

Description

Description	qty.	cat.#	price
Restek ProFLOW 6000 Electronic Flowmeter with Hard-Sided Carrying Case	ea.	22656	
ProFLOW 6000 Recalibration Service	ea.	22656-R	
Soft-Side Storage Case	ea.	22657	

*The flowmeter is designed to measure clean, dry, non-corrosive gases.

restek recommends

Recalibrate your ProFLOW 6000 Flowmeter once every year. Prolonged failure to recalibrate your unit may result in increased error. To always get the most accurate flowmeasurements, send in your flowmeter for recalibration (cat.# 22656-R).

Leak Detector



22839



22839

Hard-sided carrying case
with purchase of unit.



22657

Optional soft-side storage case is ideal for
storing your leak detector in smaller
spaces, such as your tool box.

Verify hard-to-reach leaks using
the small probe adaptor.



22658

tech tip

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

Restek Electronic Leak Detector

Don't let a small leak turn into a costly repair—protect your instrument and analytical column by using a Restek Leak Detector.

Features & Benefits include:

- Optimized sample flow path.
- New ergonomic, hand-held design.
- Rugged side grips for added durability.
- Handy probe storage for cleanliness and convenience.
- Longer lasting battery, up to 6 hours of continuous use.
- Automatic shut-off.
- A convenient carrying and storage case.
- Easy to clean probe assembly.
- A universal charger set (US, European, UK, and Australian plugs included).

Backed by a 1-year warranty, the new Restek Leak Detector sets an industry standard for performance and affordability in hand-held leak detectors.

Leak Detector Facts

Detectable gases:	helium, nitrogen, argon, carbon dioxide, hydrogen
Battery:	Rechargeable Ni-MH internal battery pack (6 hours normal operation)
Operating Temperature Range:	32°-120°F (0°-48°C)
Humidity Range:	0-97%
Warranty:	one year
Certifications:	CE, Ex, Japan
Compliance:	WEEE, RoHS

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Argon	1.0 X 10 ⁻⁴	Yellow
Carbon Dioxide	1.0 X 10 ⁻⁴	Yellow

the following leak rates.

Description	qty.	cat.#	price
Leak Detector with Hard-Sided Carrying Case and Universal Charger Set (US, UK, European, Australian)	ea.	22839	
Leak Detector Routine Maintenance Review**	ea.	22839-R	
Soft-Side Storage Case	ea.	22657	
Small Probe Adaptor	ea.	22658	

*Caution: The Restek Electronic Leak Detector is designed 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. The Restek Electronic Leak Detector may be used for determining trace amounts of hydrogen in a GC environment only.

**Routine maintenance includes inspection of the probe tip, internal/external tubing and a battery replacement.



Checking for leaks
maintains the integrity
of a GC system.

tech tip

To keep your Leak Detector performing at optimal levels, send it in every two years for a Routine Maintenance Review. Our engineers will inspect the probe tip, internal/external tubing and replace the battery. This preventive maintenance plan will help ensure your leak detector operates properly for years to come.

for more info

How much sensitivity is needed in a
leak detector?

www.restek.com/cat001

Restek Thermolite® Septa

- Usable to 340 °C inlet temperature.
- Precision molding assures consistent, accurate fit.
- Excellent puncturability.
- Preconditioned and ready to use.
- Do not adhere to hot metal surfaces.
- Packaged in precleaned glass jars.



Septum Diameter	25-pk./price	50-pk./price	100-pk./price
5mm (5/16")	27120	27121	27122
6mm (1/4")	27123	27124	27125
7mm	27126	27127	27128
8mm	27129	27130	27131
9mm	27132	27133	27134
9.5mm (5/8")	27135	27136	27137
10mm	27138	27139	27140
11mm (7/16")	27141	27142	27143
11.5mm	27144	27145	27146
12.7mm (1/2")	27147	27148	27149
17mm	27150	27151	27152
Shimadzu Plug	27153	27154	27155

Restek IceBlue® Septa

- Usable to 250 °C inlet temperature.
- Precision molding assures consistent, accurate fit.
- General-purpose septa.
- Excellent puncturability.
- Preconditioned and ready to use.
- Do not adhere to hot metal surfaces.
- Packaged in precleaned glass jars.
- Ideal for SPME.

Precision molded!

Septum Diameter	50-pk./price	100-pk./price
9mm		
9.5mm (5/8")	27158	27159
10mm	27160	27161
11mm (7/16")	27162	27163
11.5mm	27164	27165
12.7mm (1/2")	27166	27167
17mm	27168	27169
Shimadzu Plug	27170	27171

BTO® Septa

- Usable to 400 °C inlet temperature.
- Precision molding assures consistent, accurate fit.
- Partial predrilled CenterGuide design.
- Preconditioned and ready to use.
- Do not adhere to hot metal surfaces.
- Packaged in precleaned glass jars.
- Each batch GC/FID tested.
- Bleed and temperature optimized; ideal for demanding GC and GC/MS applications.

Precision molded!



Septum Diameter	50-pk./price	100-pk./price
5mm CenterGuide	27100	27101
6mm (1/4")	27102	27103
9mm CenterGuide	27104	27105
9.5mm (5/8")	27106	27107
10mm	27108	27109
11mm (7/16") CenterGuide	27110	27111
11.5mm CenterGuide	27112	27113
12.7mm (1/2") CenterGuide	27114	27115
17mm CenterGuide	27116	27117
Shimadzu Plug	27118	27119

HANDY

septum size chart

Instrument	Septum Diameter (mm)
Agilent (HP)	
5880A, 5890, 6850, 6890, 7890, PTV	11
5700, 5880	9.5/10
On-Column Injection	5
Thermo Scientific	
TRACE GC	17
GCQ w/TRACE, PTV	17
8000 series	17
Finnigan (TMQ)	
GC 9001	9.5
GCQ	9.5
QCQ	9.5
TRACE 2000	9.5
PerkinElmer	
Sigma series	11
900,990	11
8000 series	11
Auto SYS	11
Auto SYS XL	11
Shimadzu	
All models	Plug
SRI	
	Plug
Tracor	
	11.5
	9.5
	12.5
Varian	
	9.5/10
	10/8/10/9
	10/11
	1177
	9
	1075/1077
	11

SUPPLIES & ACCESSORIES

for **more** infoHow **Hot** is Your Septum?www.restek.com/cat002**i tech tip****Tips for Handling Septa**

All septa, regardless of composition, puncturability, or resistance to thermal degradation will fail if they are mishandled. Overtightening a septum nut invariably will reduce septum lifetime by increasing coring/splitting. All septa contain volatile materials (e.g., phthalates) that are released when the septum is heated (septum bleed). Because most GCs are equipped with a septum purge, septum bleed generally will disappear within 30 minutes after installing a new septum and exposing it to normal injector temperatures. All Restek septa are preconditioned and are ready to use without delay.

Note: Due to the injection port temperatures, Restek recommends using only BTO septa in Thermo Scientific instruments.

Introducing

Sky™

Inlet Liners

True Blue Performance

- Increase accuracy and reproducibility
- Achieve lower detection limits
- Use wool without risking the column

When faced with complex or difficult samples, Sky™ inlet liners from Restek use a comprehensive, state-of-the-art deactivation and are

New Sky™ liners give you the inertness you need for more accurate trace level results.

the only blue liners on the market—making them an easy-to-recognize solution to common inlet problems.

The innovative deactivation used for Sky™ liners results in exceptional inertness for a wide range of analyte chemistries. By reducing active sites and enhancing analyte transfer to the column, these liners increase accuracy and precision, allowing lower detection limits for many active compounds. In addition to improved data quality, you'll benefit from fewer liner changes and less downtime for maintenance.

Selecting the right liner for your application can be a daunting task. Sky™ inlet liners make the choice simple; the comprehensive deactivation, distinctive color, and availability in popular configurations mean Sky™ liners are the best choice for optimizing chromatographic performance. Regardless of your application, Sky™ liners provide reliable inertness and assured performance, day-after-day and analysis-after-analysis.

SUPPLIES & ACCESSORIES



The Story Behind Sky™

For over 25 years, Restek's vision has been to be the company chromatographers trust. This philosophy is the cornerstone of our business, and it's the reason our chemists and engineers are dedicated to developing innovative, best-in-class products like Sky™ liners. As chromatographers, we understand your needs and strive to develop and deliver products that make your life easier.

With Sky™ liners our goal was to create a state-of-the-art deactivation that provides superior performance, but why did we make them blue? Restek has always been associated with the color blue; to us, it signifies strength, innovation, and excellence. We made SKY™ liners blue because it represents the technological advancements and unmatched quality that define Restek products. Choose blue—the best choice for dependable results.

Simple Solutions:

Inert Sky™ Inlet Liners Improve Accuracy and Precision for a Wide Range of Analytes

Many chromatographic problems, such as poor response and missing or tailing peaks are caused by activity in the inlet liner. These effects complicate quantification and can be particularly problematic for sensitive analytes. New Sky™ inlet liners from Restek offer exceptional inertness, assuring enhanced transfer of analytes to the column, good response, and highly symmetric peaks. The inertness of these liners is due to a state-of-the-art deactivation process that completely passivates the liner and wool so that they are inert to a wide variety of reactive analytes.

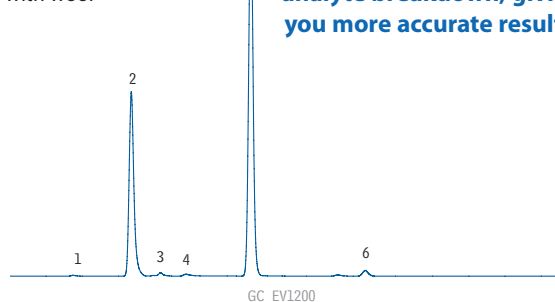
Some deactivations, such as base deactivation, are effective only for particular target compound chemistries. In contrast, the balanced deactivation of Sky™ liners prevents interactions with many chemical classes. As shown on the following pages, complex pesticide probes, as well as both acidic and basic compounds have strong responses and excellent peak shapes, demonstrating the inertness of Sky™ liners. With new Sky™ inlet liners you will see improved sensitivity, accuracy, and reproducibility liner-to-liner, which allows you to quantify challenging compounds at trace levels with confidence.

Reduced Breakdown Improves Trace Analyses

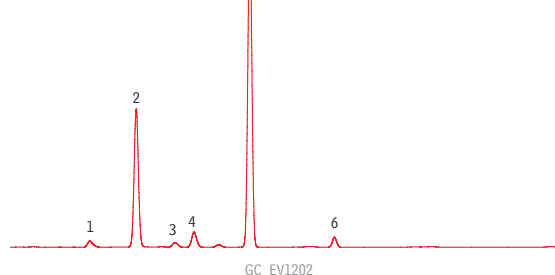
Endrin & DDT are important analytes for the environmental and food safety industries, and also serve as excellent general probes for liner inertness. Both compounds are sensitive to different modes of activity due to their chemical structures and because they are analyzed at very low concentrations (typically parts-per-billion concentrations for μ ECD analyses). As shown in Figure 1, Sky™ liners are significantly more inert than comparable liners from Agilent, showing 3-4 times less endrin and DDT breakdown.

Figure 1 Endrin and DDT breakdown with Sky™ liner showing higher inertness.

Restek Sky™ Inlet Liner
Single taper gooseneck
with wool



Agilent
Single taper gooseneck
with wool



analyzer breakdown, giving
you more accurate results.

	% Breakdown	
	endrin	DDT
Restek	4.8	1.3
Agilent	16.5	4.2

Peaks

1. DDE*
 2. Endrin
 3. DDD*
 4. Endrin aldehyde*
 5. DDT
 6. Endrin ketone*
- *breakdown products

Column Rxi®-5Sil MS, 15 m, 0.25 mm ID, 0.25 μ m (cat.# 13620); **Sample** endrin (50 ng/mL) and DDT (100 ng/mL) in hexane; **Injection** Inj. Vol.: 1 μ L splitless (hold 0.75 min.); **Liner:** Comparison of Sky™ Single Taper Gooseneck Liner with Wool (cat.# 23303.5) and Agilent Single Taper Gooseneck Liner with Wool (cat.# 5062-3587); Inj. Temp.: 250 °C.

did you know?

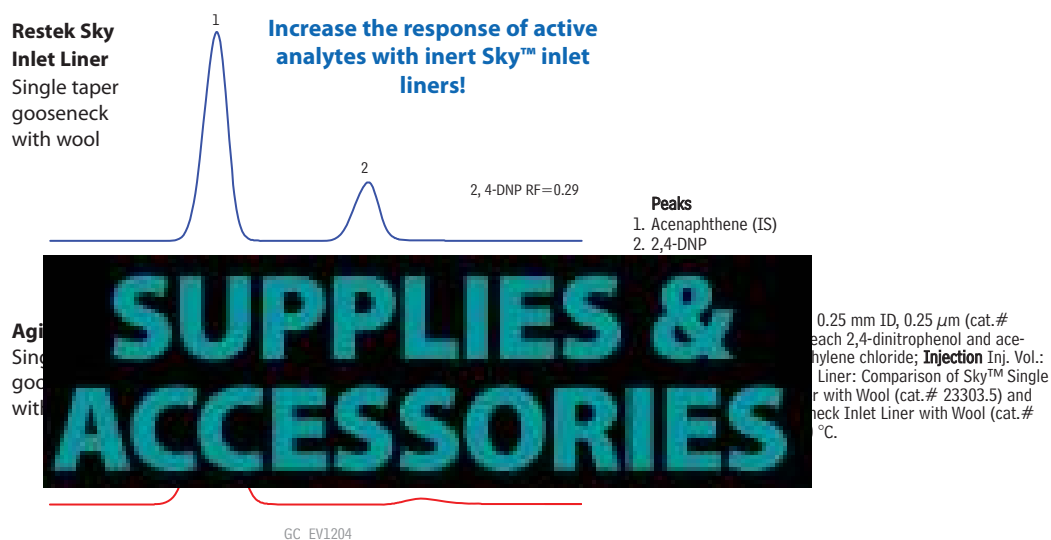
Sky™ inlet liners from Restek are extensively tested to assure consistent product quality. The color and label have been shown not to interfere with analyses or contribute to background. Choose blue—the best liner for sensitive applications.

Simple Solutions:

Inert Sky™ Inlet Liners Improve Accuracy and Precision for a Wide Range of Analytes Greater Inertness Results in Higher Analyte Response

Another common probe used to illustrate inertness is 2,4-dinitrophenol (2,4-DNP), which functions as an indicator of acid compound interactions. It is used to monitor system suitability in semivolatiles methods, which benefit from the use of wool to assist in sample vaporization. As shown in Figure 2, the response of 2,4-DNP with the Sky™ inlet liner, even at low concentrations, is superior to a competitor's liner. The Agilent liner with wool has active sites that adsorb 2,4-DNP and reduce its response. In contrast an excellent response is achieved using the Sky™ liner, even in the presence of wool.

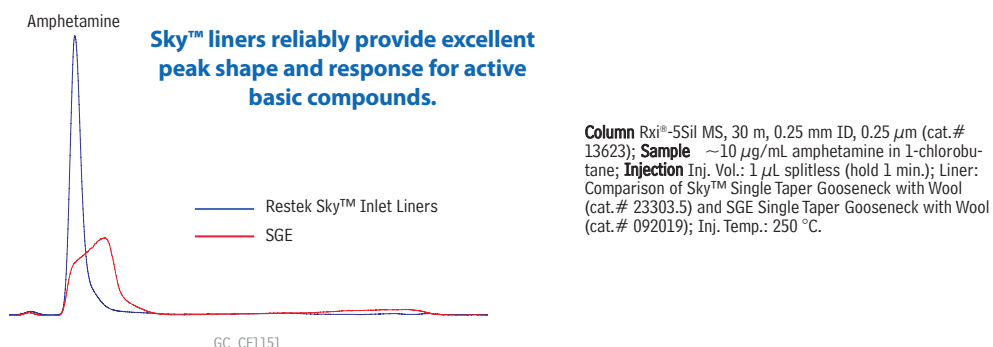
Figure 2 The state-of-the-art deactivation used for Sky™ liners with wool results in higher responses for active acid compounds, such as 2,4-DNP.



Comprehensive Deactivation Assures Excellent Peak Shape

In addition to providing excellent results for reactive pesticides and acidic compounds, Sky™ inlet liners are also highly inert to active basic compounds, such as underivatized amphetamines. The exceptional inertness of Sky™ liners produces much better peak shape than is typically seen on other liners, resulting in simpler quantification and more accurate results (Figure 3).

Figure 3 Sky™ liners are completely passivated. Even when using wool, peak shape for highly active underivatized amphetamine is excellent.

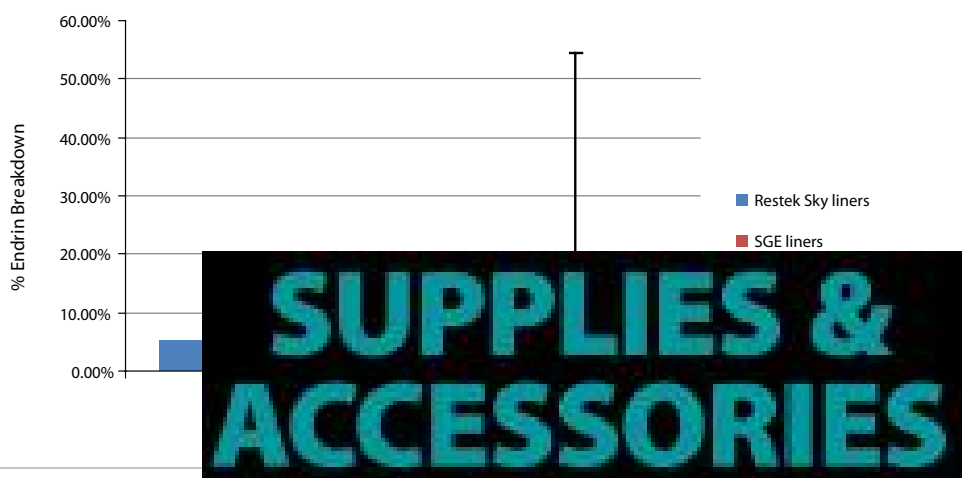


Liner-to-Liner Reproducibility: A Measure of Consistent Quality

It's not good enough to have one quality liner. You have to be confident that every liner will give the same level of performance. We test Sky™ liners extensively to ensure that each one is exceptionally inert and will provide optimal results. Using endrin breakdown as a measure of reproducibility, the data in Figure 4, based on multiple lots, illustrate that Sky™ liners are more consistently inert than competitor products.














New Sky™ liners provide exceptional inertness across a wide range of active analytes. The consistent, comprehensive deactivation process results in the accuracy and precision you need for reliable trace level analyses. Simplify liner selection with Sky™ liners from Restek—**choose blue, the best choice for dependable results.**

Figure 4 Sky™ inlet liners from Restek consistently show less endrin breakdown than comparable liners from other sources.







New Sky™ inlet liners are easily recognizable for your reordering convenience. All Sky™ liners come in specially marked boxes and are packaged in ultra-clean blister packs.


Sky™ Inlet Liners for Agilent GCs

Splitless Liners for Agilent GCs	ID OD x Length	Similar to Agilent part #	ea.	cat.#/price 5-pk.	25-pk.
 2mm Splitless	2.0mm 6.5mm x 78.5mm	5181-8818 (ea.) 5183-4703 (5-pk.) 5183-4704 (25-pk.)	23313.1	23313.5	23313.25
 2mm Splitless w/Wool	2.0mm 6.5mm x 78.5mm		23314.1	23314.5	23314.25
 2mm Single Taper Gooseneck	2.0mm 6.5mm x 78.5mm		23315.1	23315.5	23315.25
 2mm Single Taper Gooseneck w/Wool	2.0mm 6.5mm x 78.5mm		23316.1	23316.5	23316.25
 4mm Straight	4.0mm 6.3mm x 78.5mm	210-3003 (ea.) 210-3003-05 (5-pk.)	23301.1	23301.5	23301.25
 4mm Straight w/Wool	4.0mm 6.3mm x 78.5mm	19251-60540 (ea.) 5183-4691 (5-pk.) 5183-4692 (25-pk.)	23300.1	23300.5	23300.25
 4mm Single Taper Gooseneck	4.0mm 6.5mm x 78.5mm	5181-3316 (ea.) 5183-4695 (5-pk.) 5183-4696 (25-pk.)	23302.1	23302.5	23302.25
 4mm Single Taper Gooseneck w/Wool	4.0mm 6.5mm x 78.5mm	5062-3587 (ea.) 5183-4693 (5-pk.) 5183-4694 (25-pk.)	23303.1	23303.5	23303.25
 4mm Double Taper Gooseneck	4.0mm 6.3mm x 78.5mm	5181-3315 (ea.)	23308.1	23308.5	23308.25
 4mm Cyclo Double Taper Gooseneck	4.0mm 6.3mm x 78.5mm			23310.5	23310.25
Split Liners for Agilent GCs	ID OD x Length	Similar to Agilent part #	ea.	cat.#/price 5-pk.	25-pk.
 4mm Straight w/Wool	4.0mm 6.3mm x 78.5mm	5183-4692 (5-pk.) 5183-4692 (25-pk.)		23304.5	23304.25
 4mm Precision Liner w/Wool	4.0mm 6.3mm x 78.5mm	210-4004-5 (5-pk.)	23305.1	23305.5	23305.25
 4mm Cyclosplitter	4.0mm 6.3mm x 78.5mm		23312.1	23312.5	23312.25






SUPPLIES & ACCESSORIES

Split/Splitless Liners for Agilent GCs	ID OD x Length	Similar to Agilent part #	ea.	cat.#/price 5-pk.	25-pk.
 Low Pressure Drop Liner w/Wool	4.0mm 6.3mm x 78.5mm		23309.1	23309.5	
DI Liners for Agilent GCs (for 0.25/0.32/0.53mm ID Columns)	ID OD x Length	Similar to Agilent part #	ea.	cat.#/price 5-pk.	25-pk.
 Drilled Uniliner (hole near bottom)	4.0mm 6.3mm x 78.5mm	G1544-80730 (ea.)	23306.1	23306.5	
 Drilled Uniliner (hole near bottom) w/Wool	4.0mm 6.3mm x 78.5mm		23307.1	23307.5	
 Drilled Uniliner (hole near top)	4.0mm 6.3mm x 78.5mm		23311.1	23311.5	23311.25


Sky™ Inlet Liners for PerkinElmer GCs

PSS Liners for PerkinElmer GCs	ID OD x Length	Similar to PE part #	ea.	cat.#/price 5-pk.	25-pk.
 Auto SYS XL PSS Split/Splitless w/Wool	2.0mm 4.0mm x 86.2mm	N6121004	23317.1 \$42	23317.5	


Sky™ Inlet Liners for Shimadzu GCs

Split Liners for Shimadzu 17A, 2010, and 2014 GCs	ID OD x Length	Similar to Shimadzu part #	ea.	cat.#/price 5-pk.	25-pk.
 3.5mm Split	3.5mm 5.0mm x 95mm	221-41444-01	23318.1	23318.5	23318.25
 3.5mm Split w/Wool	3.5mm 5.0mm x 95mm		23319.1	23319.5	23319.25
 3.5mm Precision Liner w/Wool	3.5mm 5.0mm x 95mm		23320.1	23320.5	
Splitless Liners for Shimadzu 17A, 2010, and 2014 GCs	ID OD x Length	Similar to Shimadzu part #	ea.	cat.#/price 5-pk.	
 3.5mm Single Taper Gooseneck	3.5mm 5.0mm x 95mm	221-48335-01	23321.1	23321.5	
 3.5mm Single Taper Gooseneck w/Wool	3.5mm 5.0mm x 95mm		23322.1	23322.5	

Sky™ Inlet Liners for Thermo Scientific GCs

Split Liners for Thermo TRACE, 8000, 8000 TOP, & Focus SSL	ID OD x Length	Similar to TS part #	ea.	cat.#/price 5-pk.	25-pk.
 5mm Straight	5.0mm	453-20030	23323.1	23323.5	23323.25
 5mm Straight w/Wool				23324.5	23324.25
 5mm Precision Liner w/Wool				23327.5	
Splitless Liners for Thermo 8000, 8000 TOP, & Focus SSL	ID OD x Length	Similar to TS part #	ea.	cat.#/price 5-pk.	25-pk.
 5mm Splitless	5.0mm 8.0mm x 105mm	453 20033	23325.1	23325.5	23325.25
 5mm Splitless w/Wool	5.0mm 8.0mm x 105mm		23326.1	23326.5	23326.25

Sky™ Inlet Liners for Varian GCs

Liners for Varian 1177 S/SL Injection Ports	ID OD x Length	Similar to Varian part #	ea.	cat.#/price 5-pk.	
 4mm Split Liner w/Glass Frit	4.0mm 6.3mm x 78.5mm		23330.1	23330.5	
 4mm Precision Liner w/Wool	4.0mm 6.3mm x 78.5mm		23328.1	23328.5	
 4mm Single Taper Gooseneck	4.0mm 6.5mm x 78.5mm	392611927	23331.1	23331.5	
 4mm Single Taper Gooseneck w/Wool	4.0mm 6.5mm x 78.5mm	392611936	23332.1	23332.5	
Liners for Varian 1078/1079 Injection Ports	ID OD x Length	Similar to Varian part #	ea.	cat.#/price 5-pk.	25-pk.
 3.4mm Split-No Frit	3.4mm 5.0mm x 54mm	392611945	23329.1	23329.5	23329.25



Technical Tips for Avoiding Inlet Problems

Inlet issues can lead to poor chromatography and be a significant source of frustration in the lab. Many problems can be avoided by considering some basic principles. Here are some simple tips to help you improve chromatography and select the best liner for your application.

Consider Volume and Inner Diameter

Problems such as broad or tailing peaks, poor reproducibility, ghost peaks, and nonlinear response can result if sample expansion volume and linear velocity are not considered when choosing liner dimensions.

Sample Expansion Volume

When a liquid sample is vaporized inside an inlet liner, its volume expands considerably. Care should be taken to match the effective liner volume and the expanded volume of the injected sample. If the liner volume is exceeded, the sample will be forced back into the gas lines, causing irreproducible peak areas and sample carryover.

Linear Velocity

Choosing a liner with a narrow inner diameter will give a faster linear velocity (for a given flow rate), which will move the sample onto the column quickly, improving efficiency and helping keep peak widths narrow. This is particularly important for gaseous samples introduced via purge-and-trap or static headspace techniques, or when 0.18 mm, 0.15 mm, and 0.10 mm ID columns are used.

Solvent expansion volumes based on an injection port temperature of 250°C and

Injection Volume

Expansion Volume (μL)

For
line
app

SUPPLIES & ACCESSORIES

Hexane	Isooctane
98	78
195	155
390	310
975	775

e liner volume.

Protect Analytes from Active Sites

Active sites in the inlet or liner can interact with reactive analytes, resulting in poor chromatography and reduced response. Exposure of analytes to active sites can be minimized by carefully considering liner packing, geometry, and deactivation.

Packing

Sample characteristics and injection technique will dictate whether packing is used. Analyses of high molecular weight analytes, especially in split mode, benefit from the use of packing. However, while wool improves sample vaporization, protects the column from nonvolatile compounds, and permits larger volume injections, it can also be a source of active sites that cause poor peak shape. When using a wool packed liner, highly inert Sky™ liners are recommended for optimal performance. (See pages 206-209 for technical comparison.)

Specialized Uniliner® Geometry

Uniliner® and Drilled Uniliner® inlet liners reduce analyte exposure by allowing a fused silica column to be connected directly to the liner through a seal made between the inner glass wall of the liner and the polyimide coating on the outside of the column. This configuration maximizes the amount of sample transferred to the GC column, minimizes sample exposure to hot injection port parts, and is a good choice for trace analyses.

Use the Drilled Uniliner® inlet liner with the hole near the bottom for semivolatiles analyses or when compounds of interest could be affected by a tailing solvent peak. Use the Drilled Uniliner® inlet liner with the hole near the top for chlorinated pesticides analyses, aqueous injections, and analyses in which the compounds of interest elute away from the solvent peak. Note that instruments equipped with electronic pressure control must use Drilled Uniliner® liners, rather than standard Uniliner® liners.



Drilled Uniliner® with hole near bottom



Drilled Uniliner® with hole near top

Deactivations

Liners need to provide highly inert pathways to guard against sample adsorption (reversible or irreversible) and sample degradation. Deactivations can help accomplish this and Restek offers several deactivation choices.

Intermediate Polarity (IP) Deactivation

- Phenylmethyl-deactivated surface for better recovery of polar and nonpolar compounds.
- Compatible with most common solvents.
- Our standard deactivation—every clear Restek liner is IP deactivated unless otherwise requested.

Siltek®-Deactivation

- Minimizes breakdown.
- Low bleed.
- Thermally stable.
- “Clean and green”—manufactured without the use of harmful organic solvents.

The patented Siltek® deactivation process for liners produces a highly inert glass surface that features high temperature stability, extreme durability, and low bleed. Try Siltek® liners, guard columns, and connectors for better recovery of sample analytes.

For Siltek®-deactivated inlet liners, add the corresponding suffix number to the liner catalog number.

qty.	Siltek Liner		Siltek Liner w/Wool		Siltek Liner w/CarboFrit	
each	-214.1	\$5 addl. cost	-214.1	addl. cost	-214.1	addl. cost
5-pk.	-214.5	\$20 addl. cost	-214.5	addl. cost	-214.5	addl. cost
25-pk.	-214.25	\$90 addl. cost	-214.25	addl. cost	-214.25	addl. cost

Base Deactivation

- Excellent inertness for basic compounds.
- Recommended for use with Restek Guard Columns.

For base-deactivated inlet liners, add the corresponding suffix number to the liner catalog number.


qty.	Base-Deactivated Liner		Base-Deactivated Liner w/ Base-Deactivated Wool		Base Deactivated Liner w/CarboFrit	
each	-210.1	\$14 addl. cost	-211.1	addl. cost	-229.1	addl. cost
5-pk.	-210.5	\$45 addl. cost	-211.5	addl. cost	-229.5	addl. cost
25-pk.	-210.25	\$145 addl. cost	-211.25	addl. cost	-229.25	addl. cost

Don't Forget Routine Maintenance

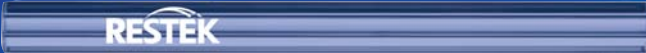
Inlet liners are the key to good injection port maintenance; changing them regularly helps prevent problems such as:

- Sample degradation resulting in poor response.
- Sample adsorption resulting in poor peak shape (tailing).
- Sample discrimination.
- Irreproducibility.
- Extraneous peaks from contamination or cored septum particles.

Finally, be sure to condition your liners at 20 °C higher than the operating inlet temperature for a minimum of 10 minutes to prepare them for use. By following these basic tips, you can avoid inlet problems and improve chromatographic performance.



Looking for the Best Solution?



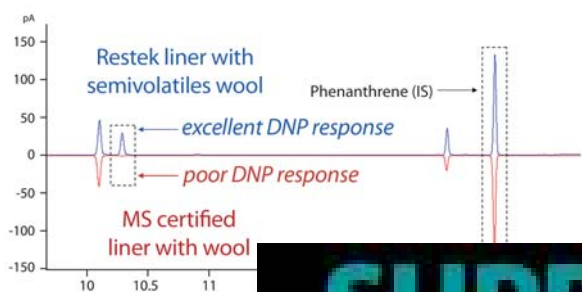
New Sky™ inlet liners, featuring a state-of-the-art deactivation, give you the inertness you need for accurate, reproducible trace level results.

See pages 206-211 for details.

Semivolatiles Wool

The new deactivation used on this wool gives it superior inertness for semivolatiles analysis. Acidic semivolatile compounds, such as 2,4-dinitrophenol (DNP), are reactive and can be difficult to quantify with wool packed in the inlet liner. With this innovative deactivation, the response of DNP is excellent and an improvement over deactivations offered by competitors (Figure 1). For example, the test shown here resulted in a DNP response factor of 0.21 (calculated relative to the internal standard), easily meeting the EPA Method 8270D criterion of 0.01. In contrast, the competitive "MS Certified Liner with Wool" showed virtually no response.

Figure 1 Response of 10 ng of 2,4-dinitrophenol compared to phenanthrene using a flame ionization detector.



To order Semivolatiles Wool, add the corresponding suffix number to the liner catalog number.

qty.	IP D			
each				
5-pk.	-231.5	\$31	addl. cost	
25-pk.	-231.25	\$81	addl. cost	

Deactivated Wool

- More inert than our traditional fused silica wool.
- Use to vaporize a sample in a liner prior to introduction into a capillary column.



Description	qty.	cat.#	price
Deactivated Wool	10 grams	24324	

Base-Deactivated Wool

Ideal for amines and other basic compounds.



Description	qty.	cat.#	price
Base-Deactivated Wool	10 grams	20999	

Prepacked Inlet Liners

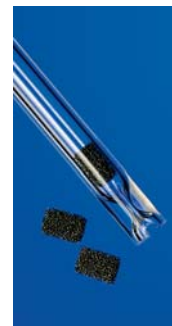
Let Restek do the work! Just add the appropriate suffix to the liner catalog number.

qty.	Wool	CarboFrit†	price
ea.	-200.1	-209.1	addl. cost
5-pk.	-200.5	-209.5	addl. cost
25-pk.	-200.25	-209.25	addl. cost

†CarboFrit inserts require a neck greater than 2mm.

CarboFrit® Inlet Liner Packing Material

- Highly inert.
- Extends analytical column lifetime.
- Enhances reproducibility of split and splitless injection.
- Uniform pore size and consistent packing density guarantee consistent flow through the liner.
- Easy to install in any liner with an ID >3.5 mm when using puller- inserter tool listed below.*



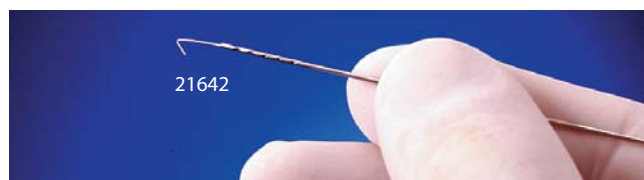
Add the corresponding suffix number to the liner catalog number.

Description	suffix	price
		addl. cost
		addl. cost
		addl. cost

pack. We will pack them on a 10-pk. basis.

SUPPLIES & ACCESSORIES

Description	qty.	cat.#	price
Frits for liner ID ≤4mm	10-pk.	20295	
Frits for liner ID >4mm	10-pk.	20294	



CarboFrit® Puller/Inserter Tool

- Hook end for removing CarboFrit® inserts.
- Bent end (90°) for inserting CarboFrit® inserts.

Description	qty.	cat.#	price
CarboFrit Puller/Inserter Tool	ea.	21642	



Use of Packings with Autosampler

We recommend using an injection port liner with wool or CarboFrit® packing when making injections with an autosampler. If there is no packing material in the liner, the solvent droplets act like water on a hot iron: they bounce around until vaporized (Leidenfrost phenomenon). Because autosamplers make rapid injections, samples can be incompletely vaporized, leading to nonreproducible peak response and tailing. You can prevent this by using wool or CarboFrit® packing material in the splitless liner, to provide a surface for the solvent droplets to "sit" on until the heat from the injector vaporizes them.

**Mini Wool Puller/Inserter**

Insert and remove wool plugs easily. Order a spare pack so you'll always have one available.



Description	qty.	cat. #	price
Mini Wool Puller/Inserter	2-pk.	20114	



No more burned fingers!

Inlet Liner Removal Tool

- Easily remove liner from injector—no more burned fingers.
- Made from high-temperature silicone.
- Won't chip or crack the liner.



Description	qty.	cat. #	price
Inlet Liner Removal Tool	3-pk.	20181	

No more burned fingers!



Eliminates u

Inlet Liner Packing Tool

- Position wool reproducibly every time.
- Accurate to a specific, measured depth.
- Can be used with all manufacturer's liners.



Loosen the nut on the side of the tool and adjust the gauge to the manufacturer's recommended depth.

Place a plug of loosely bound wool at the top of the inlet liner.

Insert the liner packing tool into the liner until the tool bottoms out. Remove the tool. The wool is positioned correctly in the liner and the liner is ready for use.

Description	qty.	cat. #	price
Inlet Liner Packing Tool	ea.	20339	

SUPPLIES & ACCESSORIES

replaced when dirty.











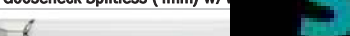
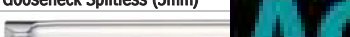



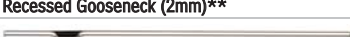

Never again will you have to burn your fingers removing a hot injection port liner. The Claw safely and cleanly removes liners, O-rings, or other small objects from the injection port. You can then place the hot objects in a clean 4 mL vial situated in the Claw holder until ready for reuse.



Description	qty.	cat. #	price
The Claw	ea.	26261	
The Claw Holder Kit (includes The Claw and holder)	kit	26262	
WISP 48 Snap Seal Vial	100-pk.	24658	

**Injector Maintenance**

Approximately ninety percent of "bad" chromatography is traceable to problems in the injection port. These problems include contaminated carrier gas, incorrect injector flows, active or dirty sites on inlet seals and liners, improper use of wool, leaks, backflash, discrimination, incorrect injector temperature, poor column installation, and use of the wrong injection technique. To minimize injection port problems, set up a routine maintenance schedule and be sure to investigate the injector first when troubleshooting.

Splitless Liners for Agilent GCs	Benefits/Uses	ID* OD x Length	Similar to Agilent part #	ea.	cat.#/price 5-pk.	25-pk.
 2mm Splitless	trace samples <2 μ L	2.0mm 6.5mm x 78.5mm	5181-8818 (ea.) 5183-4703 (5-pk.) 5183-4704 (25-pk.)	20712	20713	20714
 4mm Splitless	trace samples >2 μ L	4.0mm 6.5mm x 78.5mm	210-3003 (ea.) 210-3003-5 (5-pk.)	20772	20773	20774
 4mm Splitless w/Wool	trace samples >2 μ L	4.0mm 6.5mm x 78.5mm	19251-60540 (ea.) 5183-4691 (5-pk.) 5183-4692 (25-pk.)	22400	22401	22402
 5mm Splitless	accommodates more polar solvents and lower MW solvents	5.0mm 6.5mm x 78.5mm		22975	22976	—
 2mm Splitless (Quartz)	trace samples <2 μ L	2.0mm 6.5mm x 78.5mm	18740-80220 (ea.) 5183-4707 (5-pk.)	20914	20915	—
 4mm Splitless (Quartz)	trace samples >2 μ L	4.0mm 6.5mm x 78.5mm	—	20912	20913	—
 4mm Splitless w/Wool (Quartz)	trace samples >2 μ L	4.0mm 6.5mm x 78.5mm	—	22403	22404	—
 Gooseneck Splitless (2mm)	trace samples <2 μ L	2.0mm 6.5mm x 78.5mm	—	20795	20796	20797
 Gooseneck Splitless (4mm)†	trace samples >2 μ L	4.0mm 6.5mm x 78.5mm	5181-3316 (ea.) 5183-4695 (5-pk.) 5183-4696 (25-pk.)	20798	20799	20800
 Gooseneck Splitless (4mm) w/Wool					22406	22407
 Gooseneck Splitless (5mm)					22974	—
 Double Gooseneck Splitless (4mm)					20785	20786
 Cyclo Double Gooseneck (2mm)	trace, active, dirty samples <2 μ L	2.0mm 6.5mm x 78.5mm	—	20907	20908	—
 Cyclo Double Gooseneck (4mm)	trace, active, dirty samples >2 μ L	4.0mm 6.5mm x 78.5mm	—	20895	20896	20997
 Recessed Gooseneck (2mm)**	base easily packs with wool for dirty samples <2 μ L	2.0mm 6.5mm x 78.5mm	—	20980	20981	20982
 Recessed Gooseneck (4mm)**	base easily packs with wool for dirty samples >2 μ L	4.0mm 6.5mm x 78.5mm	—	20983	20984	20985
 Recessed Gooseneck (4mm) w/Wool**	base easily packs with wool for dirty samples >2 μ L	4.0mm 6.5mm x 78.5mm	—	22408	22409	22410
 Recessed Double Gooseneck (4mm)**	trace, active samples >2 μ L	4.0mm 6.5mm x 78.5mm	—	20986	20987	20988

*Nominal ID at syringe needle expulsion point.

**Use with two-hole ferrule for dual-column analysis.

†Use this liner for increased sensitivity.

All liners are
100%
deactivated

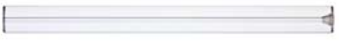








All liners are shipped intermediate
polarity (IP) deactivated unless
otherwise requested.



Sky
Inlet Liners

Looking for a Simple Solution?








See pages 206-211 for details.

Split Liners for Agilent GCs	Benefits/Uses	ID* OD x Length	Similar to Agilent part#	ea.	cat.#/price 5-pk.	25-pk.
 1mm Split**	for purge & trap inlet splitting or sample <1µL	1.0mm 6.3mm x 78.5mm	18740-80200 (ea.) 5183-4709 (5-pk.)	20972	20973	—
 4mm Split w/Wool	universal, use with Agilent 7673 autosampler	4.0mm 6.3mm x 78.5mm	19251-60540 (ea.) 5183-4691 (5-pk.) 5183-4692 (25-pk.)	20781	20782	20783
 Laminar Cup Splitter	high MW compounds	4.0mm 6.3mm x 78.5mm	—	20801	20802	—
 mini-Lam Split	high MW compounds	4.0mm 6.3mm x 78.5mm	—	20990	20991	—
 Cup Splitter	high & low MW compounds	4.0mm 6.3mm x 78.5mm	18740-80190 (ea.) 5183-4699 (5-pk.)	20709	20710	—
 Cycloplitter	dirty samples, many injections before cleaning required	4.0mm 6.3mm x 78.5mm	—	20706	20707	20708
 2mm Split Precision Liner w/Wool	dirty samples, trace samples	2.0mm 6.3mm x 78.5mm	—	20823	20824	—
 4mm Split Precision Liner w/Wool	dirty samples, trace samples	4.0mm 6.3mm x 78.5mm	210-4004-5 (5-pk.)	21022	21023	20979
 4mm Gooseneck Precision Liner w/Wool	dirty samples, trace samples	4.0mm 6.3mm x 78.5mm	210-4022-5 (5-pk.)	22983	22984	22985

Split/Splitless Liners for Agilent GCs	cat.#/price 5-pk.	25-pk.
 Low Pressure Drop Precision Liner w/Wool	21033	—
 Low Pressure Drop Liner w/Wool	20995	20996






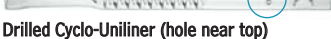





CIS4 and PTV Liners for Agilent GCs	Benefits/Uses	ID* OD x Length	Similar to Agilent part#	ea.	cat.#/price 5-pk.	10-pk.
 PTV On-Column Liner	allows on-column injection with a 0.53mm ID column	1.7mm 3.0mm x 71mm	—	24976	24977	—
 Straight Glass	general use	2.0mm 3.0mm x 71mm	5183-2036	—	—	21157
 Baffled Glass	active compounds, drugs, pesticides	1.5mm 3.0mm x 71mm	5183-2037	—	—	21704
 Glass w/Wool	large volume injections	2.0mm 3.0mm x 71mm	5183-2038	—	—	21156

SPME Liners for Agilent GCs	Benefits/Uses	ID* OD x Length	cat.#/price ea.	cat.#/price 5-pk.
 SPME Liner	ideal for low-volume SPME applications	0.75mm 6.35mm x 78.5mm	21110 \$35	—

*Nominal ID at syringe needle expulsion point.
**Use this liner for increased sensitivity.

COLUMN INSTALLS THIS END

DI Liners for Agilent GCs** (For 0.25/0.32/0.53mm ID Columns)	Benefits/Uses	ID* OD x Length	Similar to Agilent part #	ea.	cat.#/price 5-pk.	25-pk.
 Drilled Uniliner (hole near top)	trace, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm	—	21054	21055	20998
 Drilled Uniliner (hole near bottom)	trace, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm	G1544-80730	20756	20771	—
 Double Gooseneck Drilled Uniliner (hole near top)	trace, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm	—	20508	20509	—
 Double Gooseneck Drilled Uniliner (hole near bottom)	trace, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm	G1544-80700	20954	20989	—
 Drilled Cyclo-Uniliner (hole near top)	trace, dirty, high MW, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm	—	22979	22980	—
 1mm Uniliner	trace, active samples, samples <1µL	1.0mm 6.3mm x 78.5mm	—	21052	21053	—
 Uniliner	trace, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm	NEW!	22268	22269	—
 Cyclo-Uniliner	trace, dirty, high MW active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm	NEW!	22270	22271	—
 Open-top Uniliner w/Wool					22273	—

*Nominal ID at syringe needle
**Hole in Drilled Uniliner line

tech tip

Drilled Uniliner® Liners

Use the Drilled Uniliner® liner with the hole near the bottom for semivolatiles analysis or when compounds of interest could be affected by a tailing solvent peak. Use the Drilled Uniliner® liner with the hole near the top for chlorinated pesticides analysis, aqueous injections, as well as for analysis in which the compounds of interest elute away from the solvent peak.

SUPPLIES & ACCESSORIES

100%
deactivated

All liners are shipped intermediate polarity (IP) deactivated unless otherwise requested.

Sky

Inlet Liners

Looking for a Simple Solution?



New Sky™ liners, featuring a state-of-the-art deactivation, give you the inertness you need for accurate, reproducible trace level results.

See pages 206-211 for details.



Siltek® Metal Inlet Liners for Agilent GCs

- Won't crack, chip, or break like glass liners.
- Excellent response for pesticides, phenols, and other active compounds.

Liner Type (5.2mm ID x 6.3mm OD x 78.5mm)	5-pk.	25-pk.
Cyclo/Single Gooseneck	20974	20975
Single Gooseneck	21702	21703
Cyclosplitter	20726	20729
Split/Splitless w/Wool	21700	21701

Viton® O-Rings for Agilent GCs

Fit split (6.3 mm OD) or splitless
(6.5 mm OD) liners.

Description	Max. temp.	Similar to Agilent part #	qty.	cat.#	price
Viton O-Rings for Agilent GCs	250°C	5188-5365	25-pk.	20377	

High Temperature O-Rings for Agilent GCs

- Usable to 350 °C inlet temperature.
- Fits split (6.3 mm OD) and splitless (6.5 mm OD) liners.

Description	Max. temp.	10-pk. cat.#	price	25-pk. cat.#	price
High Temperature O-Rings for Agilent GCs	350°C	23403		23404	

Graphite O-Rings for Agilent and Varian 1177 Injectors

Excellent thermal stability at injection
port temperatures up to 450 °C

Description	Max. temp.	Similar to Agilent part #	qty.	cat.#	price
6.35mm ID Graphite O-Rings for split liners	450°C	5188-5366	10-pk.	22336	
6.5mm ID Graphite O-Rings for splitless liners	450°C	5188-5367	10-pk.	22337	

Liner Seals for CIS4 and PTV

Description	Max. temp.	Similar to Agilent part #	Similar to Gerstel part #	qty.	cat.#	price
Liner Seals for CIS4 and PTV	450°C	5182-9749	007541-005-00	5-pk.	22684	

Replacement Viton® O-Rings for use with the Agilent Flip Top Inlet Sealing System

Description	Similar to Agilent part #	qty.	cat.#	price
Viton Replacement O-Rings for use with the Agilent Flip Top Inlet Sealing System	5188-5366	10-pk.	22336	

Injector/Detector Plug Nuts

- Use to cap off an injector to isolate leaks.
- Use to cap off a detector for thermal cleaning.
- Use to check a detector or make-up gas flow rate.
- Use to cap off a detector and prevent hydrogen from accidentally diffusing into the oven from an unused detector base.

Description	Similar to Agilent part#	qty.	cat.#	price
Injector/Detector Plug Nuts	5020-8294	2-pk.	21883	



Septa for Agilent GCs

Preconditioned and ready to use!

Septum Diameter	25-pk./price	50-pk./price	100-pk./price
Thermolite Septa (usable to 340°C inlet temp.)			
5mm (3/16")	27120	27121	27122
9.5mm (3/8")	27135	27136	27137
10mm	27138	27139	27140
11mm (7/16")	27141	27142	27143

IceBlue Septa (usable to 250°C inlet temp.)			
9.5mm (3/8")		27158	27159
10mm		27160	27161
11mm (7/16")		27162	27163

12mm (1/2")			27101
13mm (11/16")			27107
14mm (11/8")			27109
15mm (3/4")			27111



HANDY septum size chart

Agilent Instrument	Septum Diameter (mm)
5880A, 5890, 6890, 6850, 7890, PTV	11
5700, 5880	9.5/10
On-Column Injection	5

Merlin Microseal Septa for Agilent GCs

- Allow operation from 2 to 100 psi (400 Series) or 2 to 30 psi (300 Series).
- Maximum temperature—Agilent 7890, 6890, 5890 Series II: 325 °C; Agilent 5890A: 300 °C.



Microseal High-Pressure Septa, 400 Series (100psi)	Merlin #	Similar to Agilent#	cat.#	price
Standard kit (nut, 2 septa)	404	Not offered	22810	
Starter kit (nut, 1 septum)	405	5182-3442	22811	
Nut kit (1 nut, fits 300 & 400 series septa)	403	5182-3445	22809	
High-pressure replacement septum (1 septum)	410	5182-3444	22812	

Microseal Septa, 300 Series (30psi)	Merlin #	Similar to Agilent#	cat.#	price
Standard kit (nut, 2 septa)	304	5181-8833	22813	
Starter kit (nut, 1 septum)	305	5181-8816	22814	
Microseal replacement septum (1 septum)	310	5181-8815	22815	



20117

Septum Puller

- Use hooked end for removing septa and O-rings; pointed end works well for removing stuck ferrules or debris.
- Keep several on hand in your laboratory—can be used in many different ways.



Description	qty.	cat.#	price
Septum Puller	ea.	20117	

Septum Nuts

for use with Agilent 5890/6890/6850/7890 Split/Splitless Injectors

- Needle guide allows easy penetration and prevents septum coring.
- Manual injection septum nut for on-column injections.
- Made of high-quality stainless steel.



21309

Description

Septum Nut, Autosampler & PTV (for 23-gauge needles)
Septum Nut, Manual Injection (for 26-gauge needles)

18740-60835 ea. 21309

Septum Nut Removal Tool

for Agilent 5890/6890/6850/7890 GCs

- Easily remove the septum nut without touching the heated nut—no more burned fingers!
- Unique, ergonomic handle—easy to grip.
- Nut remains in tool for quick reattachment.



24918

Description	qty.	cat.#	price
Septum Nut Removal Tool for Agilent 5890/6890/6850/7890 GCs	ea.	24918	

Injector Wrench

for Agilent 5890/6890/6850 GCs

- Use to remove the septum nut and weldments during GC maintenance.
- Use the smaller end to remove the septum nut.
- Use the larger end to tighten the split/splitless weldment nut.
- High-quality stainless steel construction.
- Meets original equipment performance.



22065

Description	Similar to Agilent part #	qty.	cat.#	price
Injector Wrench for Agilent 5890/6890/6850 GCs	19251-00100	ea.	22065	



injection port bore cleaner

aluminum oxide sanding disk (cleans critical seal on base of injector)

Injection Port Repair Tool

for Agilent Split/Splitless Injection Ports

- Remove contaminants, achieve a better seal.
- Cleans critical inlet seal areas.

21393

Description	qty.	cat.#	price
Injection Port Repair Tool for Agilent Split/Splitless Injection Ports	ea.	21393	
Replacement Sanding Disks (5 fine & 5 medium)	10-pk.	22689	
Replacement Bore Brushes (one 6.5mm & one 7mm)	2-pk.	21353	

SUPPLIES & ACCESSORIES



23018

worn & damaged threads can allow oxygen into the system—compromising analytical results and destroying columns.



Make your injection port threads like new!

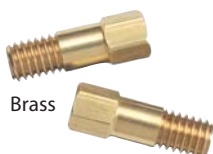
Screw the tool completely onto the injection port in a clockwise direction. Unscrew the tool and inspect the threads, repeat as necessary. When done, wipe threads with methanol to remove any debris.

Description	qty.	cat.#	price
Rethreading Tool for 1/8" compression fittings (Agilent split/splitless injection ports)	ea.	23018	

tech tip

Minimizing Injector Discrimination

When an injected sample is not completely vaporized, lower percentages of compounds that are less volatile (i.e., compounds with high boiling points or high molecular weights) are transferred into the analytical column. As a result, these later-eluting compounds will have progressively decreased peak areas. You can minimize injector discrimination by reducing injector flows, increasing the injector temperature, using pressure pulse injection or a fast autosampler, or using an injector liner that aids in vaporization (e.g., a laminar cup splitter or a liner packed with wool).



Brass



Stainless Steel

Capillary Column Nuts

for Agilent 5890/6890/7890 GCs

Available in brass or stainless steel.



for use with "compact"
Agilent-style ferrules



for use with standard ferrules

Description	Similar to Agilent part #	qty.	cat.#	price
For use with "compact" Agilent-style ferrules.				
Stainless Steel Capillary Column Nut	5181-8830	2-pk.	21884	
Brass Capillary Column Nut	5181-8830	2-pk.	21878	
For use with standard 1/16"-type ferrules.*				
Stainless Steel Capillary Column Nut	05921-21170	2-pk.	20883	
Brass Capillary Column Nut	05921-21170	2-pk.	21879	

*Designed to fit a wider variety of 1/16" ferrules



21312

Finger-Tight Capillary Column Nuts

- Rapidly tighten without wrenches; avoid stripped threads.
- Either version can be used with 0.25, 0.32, or 0.53 mm ID columns.

Description	qty.	cat.#	price
For use with "compact" Agilent-style ferrules.			
Finger-Tight Capillary Column Nut	ea.	21311	
For use with standard 1/16"-type ferrules.			
Finger-Tight Capillary Column Nut	ea.	21312	



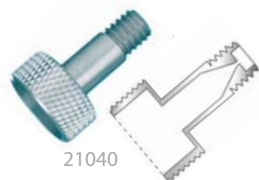
21034

Hot Swap Capillary Column Nuts

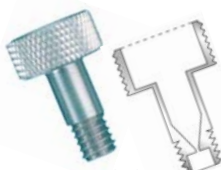
- No more burned fingers!
- No more downtime waiting for injector parts to cool down.

Never worry again about burned fingers or injector to cool down. The Hot Swap Capillary Column Nut allows you to change your capillary column while the injector temp is still hot.

Description	qty.	cat.#	price
For use with "compact" Agilent-style ferrules.			
Hot Swap Capillary Column Nut	ea.	22348	
For use with standard 1/16"-type ferrules.			
Hot Swap Capillary Column Nut	ea.	22347	



21040



21041

Finger-Tight Capillary Column Nuts

- Allow wrench-free column installations.
- Work with standard or compact (Agilent-style) ferrules.
- Made from high-quality stainless steel.

Description	Similar to Agilent part #	qty.	cat.#	price
For use with "compact" Agilent-style ferrules.				
Finger-Tight Capillary Column Nuts	5020-8293, 5020-8292	2-pk.	21040	
For use with standard 1/16"-type ferrules.				
Finger-Tight Capillary Column Nuts	5020-8293, 5020-8292	2-pk.	21041	



for consistent

Description	qty.	cat.#	price
Capillary Installation Gauge for Agilent-style fittings (compact ferrules)	ea.	21034	
Capillary Installation Gauge for 1/16" fittings (1/16" ferrules)	ea.	21399	

*Recommended for use with graphite ferrules.

Inlet Maintenance Kit for Agilent GCs

- Includes the most common consumable GC supplies and tools.
- All parts meet or exceed performance of instrument manufacturer's parts.
- Parts list makes reordering easy.



22181

Inlet kit includes:

- 0.4, 0.5, and 0.8 mm ID graphite ferrules.
- Viton® O-rings.
- Capillary nuts.
- Inlet seals.
- Reducing nut.
- Scoring wafer.
- 11 mm Thermolite® septa.
- 4.0 mm single gooseneck liner.
- 4.0 mm split liner with wool.
- Capillary column caps.
- 1/4" x 5/16" wrench.
- Septum puller.
- Installation gauge.
- Wire cleaning brush.
- Jet reamers/ferrule removers.
- Inlet liner removal tool.
- Septa nut removal tool.

Description	qty.	cat.#	price
Inlet Maintenance Kit	kit	22181	



Flip Seals

A **reversible** Dual Vespel® Ring Inlet Seal that lasts twice as long, for the same great price!

Our new Flip Seal greatly improves injection port performance while saving you time and money. This reversible inlet seal allows twice as many uses as other inlet seals, at the same cost. By using our patented Dual Vespel® Ring technology, the Flip Seal features two soft Vespel® rings, one on the top and one on the bottom, which eliminate the need for a washer. Our new reversible design allows you to flip the inlet seal and use it twice as many times.



1/16" Adaptor Fitting

Feature

Benefit

Reversible design.	Allows twice as many uses as other seals, at the same cost.
Vespel® ring embedded in bottom surface.	Eliminates need for a washer.
Vespel® ring embedded in top surface.	Very little torque required to make seal—reduces operator variability.
Lower leak rate compared to OEM metal inlet seals.	Less detector noise.
Prevents oxygen from permeating the carrier gas.	Increases column lifetime.
Gold or Siltek Treated seals.	Reduces breakdown and adsorption of compounds, maximizing component transfer to GC column.

restek **innovation**



A Dual Vespel® Ring Inlet Seal eliminates the need for a washer! →

SUPPLIES & ACCESSORIES

0.8mm ID Flip Seal Dual Vespel Ring Inlet Seal	2-pk./price	10-pk./price
	23409	23410
	10-pk./price	
	23413	23414
qty.	cat.#	price
kit	23406	

Note that the Flip Seal requires a special reducing nut, which is included in the kit.

Dual Vespel® Ring Inlet Seals

Washerless, leak-tight seals for Agilent GCs

- Does not require a separate washer.
- Requires less torque to seal.
- Does not require retightening of reducing nut after several oven cycles.
- Extends column lifetime by preventing oxygen from reaching the column.
- Same price as the regular inlet seals with washers.



Extend your column lifetimes!



0.8mm ID Dual Vespel Ring Inlet Seal	2-pk./price	10-pk./price	50-pk./price
Gold-Plated	21240	21241	23418
Siltek Treated	21242	21243	23419
Stainless Steel	21238	21239	23420
1.2mm ID Dual Vespel Ring Inlet Seal	2-pk./price	10-pk./price	
Gold-Plated	21246	21247	
Siltek Treated	21248	21249	
Stainless Steel	21244	21245	

NEW!

Now available in economical 50-pks.

Dual Vespel® Ring Cross-Disk Inlet Seals

for Agilent GCs

- Ideal for high-flow split applications.
- Washerless, leak-tight seals.

0.8mm ID Dual Vespel Ring Cross-Disk Inlet Seal	2-pk./price	10-pk./price
Gold-Plated	22083	22084
Siltek Treated	22085	22086



Replacement Inlet Seals with Washers

- Siltek® treatment provides inertness similar to fused silica.
- All seals include washers.

Replacement Inlet Seals

for Agilent GCs

The inlet seal at the base of the Agilent 5890/6890/7890 GC injection port contacts the sample and must be changed frequently to prevent adsorption of active compounds. In addition, septum fragments and sample residue accumulate on the disk surface, requiring disk replacement.

To reduce breakdown and adsorption of active compounds, use Siltek® or gold-plated seals.

Single-Column Installation 0.8mm ID (Opening)

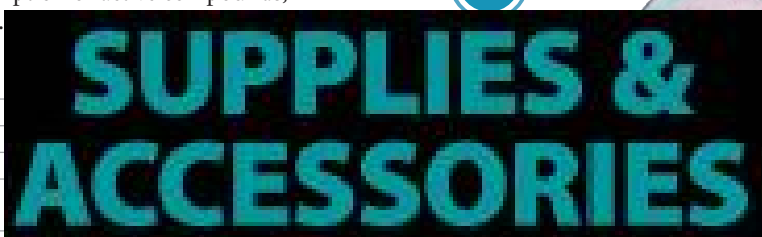
Gold-Plated
Siltek Treated
Stainless Steel

0.25/0.32mm ID Dual-Column Installation 1.2mm ID (Opening)

Gold-Plated	21305	21306
Siltek Treated	21307	21308
Stainless Steel	20390	20391

0.53mm ID Dual-Column Installation 1/16-inch ID (Opening)

	2-pk./price	10-pk./price
Stainless Steel	20392	20393



An inlet seal is recommended for dual columns using a two-hole ferrule.

Replacement Inlet Seal Washers

Description	Similar to Agilent part #	qty.	cat.#	price
Replacement Inlet Seal Washers	5061-5869	15-pk.	21710	



Cross-Disk Inlet Seals

for Agilent GCs

- Ideal for high-flow split applications on Agilent 5890 GCs.
- All seals include washers.

0.8mm ID Cross-Disk Inlet Seal	Similar to Agilent part #	2-pk./price	10-pk./price
Gold-Plated	5182-9652	20477	20476
Siltek Treated	—	20475	20474

1.2mm ID Cross-Disk Inlet Seal	Similar to Agilent part #	2-pk./price	10-pk./price
Gold-Plated	—	21009	\$71 21010
Siltek Treated	—	21011	\$71 21012



Silver PTV Seals

for Agilent 6890 GCs

Description	Similar to Agilent part #	qty.	cat.#	price
Silver PTV Seals for Agilent 6890 GCs	5182-9763	5-pk.	21409	



Not available in Germany
or Japan.

restek **innovation!**

Helping our customers
improve efficiency!



Simply slip the Weldment Removal Tool over the weldment, then twist and remove. For speed and efficiency, the weldment stays in the Weldment Removal Tool until you are ready to reattach it.

EZ Twist Top® Split/Splitless Injection Ports for Agilent GCs

The importance of injection port maintenance has been well documented by instrument and column companies industry wide. Restek has made it easy to carry out this maintenance with the innovation of our EZ Twist Top® injection port.

- Change inlet liners faster and more easily.
- Gas lines are attached to shell weldment bottom to help eliminate broken gas lines.
- Gas lines don't interfere with routine maintenance.
- Weldment Removal Tool allows for quick removal of the hot weldment without fingers ever touching hot surfaces.
- Weldment stays secure in the tool for reattachment.

Get the EZ Twist Top® ADVANTAGE

	Restek EZ Twist Top®	Agilent Flip Top
Eliminate damaged gas lines	✓	
Siltek deactivation for enhanced inertness & durability	✓	
Avoid touching hot metal surfaces—Weldment removal tool included	✓	

Designed for "drop in"
installation!

22175

SUPPLIES & ACCESSORIES



qty. cat.# price

kit 22177

Injection Port Assembly Kit, Siltek Treated

Includes: Siltek shell weldment, 2 weldment O-rings, Siltek Dual Vespel Ring inlet seal, septum nut, reducing nut, stainless steel capillary nut for use with 1/16" ferrules, and weldment removal tool

kit 22178

Weldment

(2 weldment O-rings are installed on the weldment)

ea. 22724

Weldment, Siltek Treated

(2 weldment O-rings are installed on the weldment)

ea. 22732

Shell Weldment

ea. 22175

Shell Weldment, Siltek Treated

ea. 22176

Weldment O-rings

10-pk. 22729

High Temperature Weldment O-Rings

10-pk. 23405

Septum Nut, Autosampler & PTV (for 23-gauge needles)

ea. 20631

Stainless Steel Capillary Column Nut (for use with standard 1/16" ferrules)

2-pk. 20883

Reducing Nut

ea. 22078

0.8mm Dual Vespel Ring Inlet Seal, Siltek Treated

2-pk. 21242

10-pk. 21243

Weldment Removal Tool

ea. 22728

Visit www.restek.com/slideshows for an educational video on our EZ Twist Top injection port system.



Which EZ Twist Top® should you buy?

The type of split vent trap you have connected to the EPC module/block on your 6890/6850 Agilent GC determines which EZ Twist Top® Injection Port you need to buy.

Simply remove the top and rear panel on the GC and see if you have the small (pencil type) split vent filter (cat.# 22820) or the large canister type filter (cat.# 23031) attached to the split vent gas line. If you have the small (pencil type) split vent filter, you need the EZ Twist Top® Injection Port for Agilent 6890/6850 GCs (cat.# 22721 or 22722). If you have the large canister filter, you'll need the EZ Twist Top® with Optional Split Vent for Agilent 6890/6850 GCs, for use with large canister type filters (cat.# 22735 or 22736).

EZ Twist Top® Split/Splitless Injection Port for Agilent 6890/6850 GCs (for use with large canister type filter)

Description	qty.	cat.#	price
Complete Injection Port Assembly Kit			
Includes: split/splitless weldment, shell weldment, 2 weldment O-rings, Siltek Dual Vespel Ring inlet seal, septum nut, reducing nut, stainless steel capillary nut for use with 1/16" ferrules, and weldment removal tool	kit	22735	
Complete Injection Port Assembly Kit, Siltek Treated			
Includes: Siltek split/splitless weldment, Siltek shell weldment, 2 weldment O-rings, Siltek Dual Vespel Ring inlet seal, septum nut, reducing nut, stainless steel capillary nut for use with 1/16" ferrules, and weldment removal tool	kit	22736	
Optional Split/Splitless Shell Weldment	ea.	22733	
Optional Split/Splitless Shell Weldment, Siltek Treated	ea.	22734	

EZ Twist Top® Split/Splitless Injection Port for Agilent 6890/6850 GCs with Pencil Traps

Description	qty.	cat.#	price
Injection Port Assembly Kit			
Includes: split/splitless weldment, shell weldment, 2 weldment O-rings, Siltek Dual Vespel Ring inlet seal, septum nut, reducing nut, stainless steel capillary nut for use with 1/16" ferrules, and weldment removal tool	kit	22721	
Injection Port Assembly Kit, Siltek Treated			
Includes: Siltek split/splitless weldment, Siltek shell weldment, 2 weldment O-rings, Siltek Dual Vespel Ring inlet seal, septum nut, reducing nut, stainless steel capillary nut for use with 1/16" ferrules, and weldment removal tool	kit	22722	
Weldment (2 weldment O-rings are installed on the weldment)	ea.	22724	
Weldment, Siltek Treated (2 weldment O-rings are installed on the weldment)	ea.	22732	
Shell Weldment	ea.	22727	
Shell Weldment, Siltek Treated	ea.	22731	
Weldment O-rings	10-pk.	22729	
High Temperature Weldment O-Rings	10-pk.	23405	
Septum Nut, Autosampler & PTV (for 23-gauge needles)	ea.	20631	
Stainless Steel Capillary Column Nut (for use with standard 1/16" ferrules)	2-pk.	20883	
Reducing Nut	ea.	22078	
0.8mm Dual Vespel Ring Inlet Seal, Siltek Treated	2-pk.	21242	
	10-pk.	21243	
Weldment Removal Tool	ea.	22728	

EZ Twist Top® Split/Splitless Injection Port for Agilent 5890 GCs

Description	qty.	cat.#	price
Injection Port Assembly Kit			
Includes: split/splitless weldment, shell weldment, 2 weldment O-rings, Siltek Dual Vespel Ring inlet seal, septum nut, reducing nut, stainless steel capillary nut for use with 1/16" ferrules, and weldment removal tool	kit	22725	
Injection Port Assembly Kit, Siltek Treated			
Includes: Siltek split/splitless weldment, Siltek shell weldment, 2 weldment O-rings, Siltek Dual Vespel Ring inlet seal, septum nut, reducing nut, stainless steel capillary nut for use with 1/16" ferrules, and weldment removal tool	kit	22726	
Weldment (2 weldment O-rings are installed on the weldment)	ea.	22724	
Weldment, Siltek Treated (2 weldment O-rings are installed on the weldment)	ea.	22732	
Shell Weldment	ea.	22727	
Shell Weldment, Siltek Treated	ea.	22731	
Weldment O-rings	10-pk.	22729	
High Temperature Weldment O-Rings	10-pk.	23405	
Septum Nut, Autosampler & PTV (for 23-gauge needles)	ea.	20631	
Stainless Steel Capillary Column Nut (for use with standard 1/16" ferrules)	2-pk.	20883	
Reducing Nut	ea.	22078	
0.8mm Dual Vespel Ring Inlet Seal, Siltek Treated	2-pk.	21242	
	10-pk.	21243	
Weldment Removal Tool	ea.	22728	

NEW!



SUPPLIES & ACCESSORIES



did you know?

You can now heat your EZ Twist Top® Injection Port to even higher temperatures. Our new High Temperature Weldment O-rings (cat.# 23405) won't melt in the injection port and can reach up to 350 °C.

High Temperature O-rings are also now available for split (6.3 mm OD) and splitless (6.5 mm OD) liners for Agilent GCs (cat.# 23403 and 23404, **page 219**).

Use our new High Temperature O-rings for optimal performance at higher temperatures.

RESTEK

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Split/Splitless Injection Ports for Agilent GCs

Would you like better performance from your injector? Our Siltek® treated split/splitless injector is a direct replacement for Agilent 5890 and 6890/6850 GCs, but Siltek® treatment passivates the metal surface to ensure an inert pathway for the sample, delivering increased performance. The injector is manufactured from high-quality stainless steel and meets or exceeds Agilent original equipment performance.


Split/Splitless Injection Port
 (Direct Replacement or Siltek® Treated)
 for Agilent 5890 GCs

Description	Similar to Agilent part #	qty.	cat. #	price
Replacement Weldment*	19251-60575	ea.	20265	
Replacement Weldment*, Siltek Treated	19251-60575	ea.	20267	
Replacement Shell Weldment	19251-80570	ea.	20266	
Replacement Shell Weldment, Siltek Treated	19251-80570	ea.	20268	


Split/Splitless Injection Port
 (Direct Replacement or Siltek® Treated)
 for Agilent 6890/6850 GCs

Description	Similar to Agilent part #	qty.	cat. #	price
Replacement Weldment with EPC	G1544-60575	ea.	22674	
Replacement Weldment with EPC, Siltek Treated	G1544-60575	ea.	22672	
Replacement Weldment*	19251-60575	ea.	20265	
Replacement Weldment*, Siltek Treated	19251-60575	ea.	20267	
Replacement Shell Weldment	G1544-80570	ea.	22673	
Replacement Shell Weldment, Siltek Treated	G1544-80570	ea.	22671	
Split/Splitless Weldment (for use with large canister type filter)	G1544-60585	ea.	22686	
Split/Splitless Weldment (for use with large canister type filter), Siltek Treated	G1544-60585	ea.	22670	

*For use with manual flow or EPC on Agilent 5890 GCs. For use with manual flow only on Agilent 6890/6850 GCs.

Injection Port Weldments for Agilent GCs
 for use with Purge and Trap Systems

Easily attach your purge and trap with pre-installed low dead volume fittings.


Injection Port Weldments
 for Agilent GCs with Tekmar Purge and Trap Systems

Description	qty.	cat. #	price
Weldment for Agilent 6890 GCs	ea.	22664	
Weldment for Agilent 6890 GCs with large canister type filter	ea.	22668	
Weldment for Agilent 5890 GCs	ea.	22666	

SUPPLIES & ACCESSORIES

Injection Port Weldments
 for Agilent GCs with OI Purge and Trap Systems

Description	qty.	cat. #	price
Weldment for Agilent 6890 GCs	ea.	22665	
Weldment for Agilent 6890 GCs with large canister type filter	ea.	22669	
Weldment for Agilent 5890 GCs	ea.	22667	


tech tip
Installing a New Weldment

To eliminate possible leaks and damage to the weldment, always replace the split vent line, nut, and ferrule when installing a new shell weldment.



22352



22349



21409



Inlet Adaptor



20272



20270

PTV Inlet Adaptor Kit

for Gerstel CIS 3 and CIS 4 PTV Inlets

- Meets original manufacturer's performance.
- Includes inlet adaptor, silver PTV seal, and slotted capillary nut.

Description	Similar to Gerstel part #	qty.	cat.#	price
PTV Inlet Adaptor Kit for 0.25 and 0.32mm ID Columns	007259-045-00	kit	22350	
PTV Inlet Adaptor Kit for 0.53mm ID Columns	007259-007-00	kit	22351	
Silver PTV Seals	002841-005-00	5-pk.	21409	
PTV Slotted Capillary Column Nut	001268-005-00	2-pk.	22349	
Liner Seal Pre-Seat Tool	007541-005-00	1-pk.	20427	

Gerstel GRAPHPACK® 3D/2 Connectors & Ferrules

GRAPHPACK® technology provides a complete system that quickly and reliably makes a leak-tight, low-dead-volume connection. The central component is a metal-jacketed graphite ferrule—the ideal seal for GC applications.

Gerstel GRAPHPACK® 3D/2 Connectors

Description	Fits Column ID	qty.	cat.#	price
GRAPHPACK 3D/2 Connector*	0.25mm to 0.32mm ID	ea.	20272	
GRAPHPACK 3D/2 Connector*	0.45mm to 0.7mm ID	ea.	20273	

GRAPHPACK® 3D/2 Ferrules

	qty.	cat.#	price
10-pk.	20271		
10-pk.	20270		
10-pk.	20274		



20427

Vacuum Vu-Union® Connector

for GC/MS Applications

- Connects analytical column to MS transfer line.
- Use under vacuum conditions.
- Use only with Vu-Union® Vespel®/graphite ferrules (order ferrules separately).
- Includes metal housing body, one deactivated tapered glass insert, and Vu-Union® Helping Hand.
- Fits column ODs from 0.33–0.74 mm (Restek 0.1 mm–0.53 mm ID).

A specifically designed Vu-Union® glass insert permits more torque to be applied to the ferrules without fear of cracking the insert. The hex end nuts enable you to use wrenches to tighten the end fittings.

Vu-Union® Helping Hand

The Helping Hand is designed to hold in place the metal housing of the Vacuum Vu-Union® connector. This allows you to easily assemble the columns in the glass insert and tighten the nuts. The Helping Hand is included with the Vacuum Vu-Union® connector.



Description	qty.	cat.#	price
Vacuum Vu-Union Connector (with the Helping Hand)	ea.	20427	
Replacement Inserts	3-pk.	20428	

Liner Seals for CIS4 and PTV



Description	Max. temp.	Similar to Agilent part #	Similar to Gerstel part #	qty.	cat.#	price
Liner Seals for CIS4 and PTV	450°C	5182-9749	007541-005-00	5-pk.	22684	

ChromaBLOGraphy

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Visit us at blog.restek.com



27184

1/16-Inch Capillary Inlet Adaptor Fitting Kit (Split/splitless fitting for capillary columns)

- 1/16-inch split/splitless fitting that accepts standard capillary ferrules.
- Easier to install capillary columns because the nut protrudes farther from the insulated injection port chamber.
- Same column insertion depth as the original manufacturer's equipment.
- Kit includes adaptor fitting, capillary nut, gold plated 0.8 mm ID Dual Vespel® Ring Inlet Seal, and one 0.4 mm ID ferrule.

Description	qty.	cat.#	price
1/16-Inch Capillary Inlet Adaptor Fitting Kit	kit	27184	
	2-pk.	21240	
0.8mm ID Dual Vespel Ring Inlet Seal, Gold-Plated	10-pk	21241	

Direct Replacement Reducing Nut

- Made from high-quality stainless steel
- Meets original manufacturer's performance

Description	Similar to Agilent part #	qty.	cat.#	price
Reducing Nut	18740-20800	ea.	22078	



24323

EPC Test Kit

for Agilent 6890 GCs

Kit includes 3 O-rings, 2 plugs, 1 mounting screw and 1 test block.

Description	Similar to Agilent part #	qty.	cat.#	price
EPC Test Kit	G1530-60960*	kit	24323	

*Similar to Agilent part # G1530-60960, but not exact equivalent. Kits differ in parts.



23035

Heater Cartridge & Platinum Resistance Thermometer (PRT) Sensor

for Agilent 5890 GCs

- Use with 5890 FID and split/splitless weldments.
- Meets or exceeds original manufacturer's performance.

Description	Similar to Agilent part #	qty.	cat.#	price
Injector/FID Heater and Injector/FID PRT Sensor	05890-61140	kit	22068	
Injector/FID Heater	19231-60620	ea.	22069	
Injector/FID PRT Sensor	19231-60660	ea.	23035	

Heat Sink

for Agilent 5890 GC Split/Splitless Injector

Meets or exceeds original manufacturer's performance.



Description	Similar to Agilent part #	qty.	cat.#	price
Heat Sink	18740-20940	ea.	20409	



Catch the Buzz

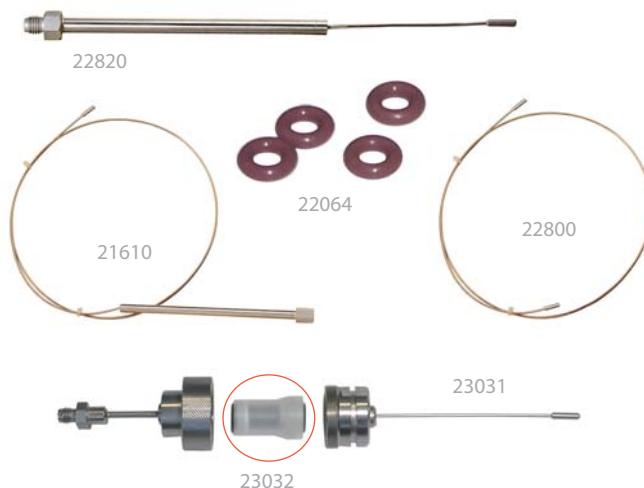
Sign up for Restek's e-newsletter, *The Buzz*
www.restek.com/buzz

**Heater Block Retaining Nuts**

for Agilent GC Split/Splitless Injectors

- Aluminum construction.
- Meet or exceed manufacturer's performance.

Description	Similar to Agilent part #	qty.	cat.#	price
Heater Block Retaining Nut for Agilent 5890 GCs	19251-20620	ea.	22080	
Heater Block Retaining Nut for Agilent 6890/6850 GCs	G1544-20590	ea.	23042	

**Replacement Chemical Traps**

for Agilent GCs

- Easy to install.
- Attach to same fittings as original manufacturer's equipment.
- Built-in frits retain fine particles; adsorbents remove both

**Oven Temperature Sensor**

for Agilent GCs

Description	Similar to Agilent part #	qty.	cat.#	price
Oven Temperature Sensor for Agilent 5890 GC	05890-61030	ea.	23040	
Oven Temperature Sensor for Agilent 6890 GC	G1530-61030	ea.	23039	

SUPPLIES & ACCESSORIES

	qty.	cat.#	price
	ea.	22820	
	ea.	21610	
(Includes all installation hardware.)	19251-80525	2-pk.	22800
O-Rings for Agilent Trap Fittings	5180-4181	25-pk.	22064
Optional Split Vent Trap Assembly for Agilent 6890/6850 GCs	G1544-60610	kit	23031
Replacement Traps (2) and O-Rings (4)	G1544-80530	kit	23032

**60 psig Backpressure Regulator Kit**

Increase the versatility of your Agilent 5890 GC by replacing the existing 30 psig (207 kPa) backpressure regulator and gauge with our 60 psig (414 kPa) regulator. Enables you to use longer 60 m and 105 m columns as well as shorter 10 m columns. Includes complete instructions.

Description	Similar to Agilent part #	qty.	cat.#	price
Backpressure Regulator Kit	19246-60630	kit	20634	

also available**Looking for septa for Agilent GCs?**See **page 219** or visit www.restek.com and search on septa.



Oven Flapper Assemblies for Agilent 5890/6890 GCs

- Ensure even and consistent column heating when the insulation becomes damaged or worn.
- Replacement Insulation Gasket and Hardware Kit includes the insulation gasket, 2 screws and 2 nuts.
- Meets or exceeds original manufacturer's performance.
- Insulation is replaceable, using Restek's Oven Flapper Assemblies.

Description	Similar to Agilent part #	qty.	cat. #	price
Oven Flapper Assembly for Agilent 5890 GCs				
Oven Flapper Assembly for Agilent 6890 GCs				
Replacement Insulation Gasket and Hardware Kit*				

*Fits Restek's Oven Flapper Assemblies

Injector Wrench

for Agilent 5890/6890/6850 GCs

- Use to remove the septum nut and weldments during GC maintenance.
- Use the smaller end to remove the septum nut.
- Use the larger end to tighten the split/splitless weldment nut.
- High-quality stainless steel construction.
- Meets original equipment performance.

22065



Description	Similar to Agilent part #	qty.	cat. #	price
Injector Wrench for Agilent 5890/6890/6850 GCs	19251-00100	ea.	22065	

Rethreading Tool

for Agilent Split/Splitless Injection Ports

- Repair worn or damaged threads



23018

oxygen into the system—
destroying columns.

**SUPPLIES &
ACCESSORIES**



Air Diverter for Agilent GCs

- Divert GC exhaust heat up and away from the lab bench.
- Meets or exceeds original manufacturer's performance.
- Easy to install—no tools required.

Description	Similar to Agilent part #	qty.	cat. #	price
Air Diverter for Agilent 5890/6890/7890 GCs	19247-60510, G1530-80650	ea.	22076	



Make your injection port
threads like new!

Screw the tool completely onto the injection
port in a clockwise direction. Unscrew the tool
and inspect the threads, repeat as necessary.
When done, wipe threads with methanol to
remove any debris.

Description	qty.	cat. #	price
Rethreading Tool for 1/8" compression fittings (Agilent split/splitless injection ports)	ea.	23018	

Sky
Inlet Liners

Looking for a
Simple Solution?

RESTEK

New Sky™ liners, featuring a state-
of-the-art deactivation, give you the
inertness you need for accurate,
reproducible trace level results.

See pages 206-211 for details.

Inlet Liner Removal Tool

- Easily remove liner from injector—no more burned fingers.
- Made from high-temperature silicone.
- Won't chip or crack the liner.



No more
burned
fingers!

Description	qty.	cat. #	price
Inlet Liner Removal Tool	3-pk.	20181	



MLE
Make Life
Easier!

22186

Everything you need in one complete kit!

No more burned
fingers!



The Claw and The Claw Holder

- Easily removes hot liners from injection ports.
- 4mL vials (not included) can be replaced when dirty.

Never again will you have to burn your fingers removing a hot injection port liner. The Claw safely and cleanly removes liners, O-rings, or other small objects from the injection port. You can then place the hot objects in a clean 4 mL vial situated in the Claw holder until ready for reuse.



Description	qty.	cat. #	price
The Claw	ea.	26261	
The Claw Holder Kit (includes The Claw and holder)	kit	26262	
WISP 48 Snap Seal Vial	100-pk.	24658	

SUPPLIES & ACCESSORIES

- 1/8", 3/16", and 1/4" nylon brushes
- 1/4", 3/8", and 3/16" stainless steel wire tube brushes
- stainless steel surface brush
- 6 stainless steel jet reamers (0.25–0.65 mm OD)
- 1/4" x 5/16" open end wrench
- 3/8" x 7/16" open end wrench
- 7/16" x 1/2" open end wrench
- 1/2" x 9/16" open end wrench
- mini wool puller/insertor tool
- 4-inch tapered needle file
- swivel head flashlight
- mini hand drill set
- 15 cm compact steel ruler
- pocket magnifier
- high temperature string (1 meter)
- pipe cleaner (12-inch)
- cotton tip swabs (pk. of 25)

Description	qty.	cat. #	price
MLE Capillary Tool Kit for Agilent GCs	kit	22186	

Column Hanger for Agilent 7890, 6890, 5890, and 5880A GCs

NEW!



Description	qty.	cat. #	price
Column Hanger for Agilent 7890, 6890, 5890, and 5880A GCs	ea.	22128	

also **available**

Looking for autosampler vials?

Restek carries a full line of autosampler vials for Agilent autosamplers. See **pages 353 to 363** or visit www.restek.com and search on autosampler vial.



Direct Injection (DI) Inserts and Liner Adaptor for 1/4-Inch Packed Column Injection Ports (for 0.25, 0.32, & 0.53 mm ID columns)



DI Glass Inserts

for Agilent 5890 Packed Column GC

- Tolerances closely controlled.
- Can be removed from the septum nut weldment.

Description	Similar to Agilent part #	qty.	cat.#	price
DI Glass Inserts for Agilent 5890 Packed Column GC (1.7mm ID x 3.0mm OD x 93mm)	5181-3382, 5080-8732	5-pk.	20967	



DI Uniliner® Liners

for Agilent 5890 Packed Column GC

- Press-Tight® taper forms dead-volume-free connection to column.
- Minimizes solvent and peak tailing.
- Use with 0.25, 0.32, and 0.53 mm ID capillary columns.
- Can be removed from the septum nut weldment.

Description	Similar to Agilent part #	qty.	cat.#	price
DI Uniliner Liner for Agilent 5890 Packed Column GC (1.7mm ID x 3.0mm OD x 93mm)				

DI Liner Adaptor

for Agilent 5890 Packed Column GC

- Uses standard 1/16-inch capillary nut and ferrules.
- Convenient wrench pad at base.
- Includes 1/4-inch graphite ferrule and stainless steel nut.
- Use with Agilent or Restek DI glass inserts or Restek DI Uniliner® liners for an Agilent 5890 packed column GC.



Description	Similar to Agilent part #	qty.	cat.#	price
DI Liner Adaptor for Agilent 5890 Packed Column GC	19244-80540	ea.	21303	

Siltek® Septum Packed Purge Port Weldment

for Agilent 5890 GCs

Siltek® treatment makes weldment inert and eliminates adsorption of sensitive compounds (e.g., DDT and Endrin). Order Viton® O-rings (below) and appropriate septa separately. See page 219.



SUPPLIES & ACCESSORIES

Micropacked Inlet Conversion Kits

- Convert a capillary GC split/splitless inlet for use with 1/16" OD micropacked columns.
- For use with Agilent 5890 and 6890 GCs.
- Sample pathways deactivated for ultimate inertness.

Description	qty.	cat.#	price
Micropacked Column Adaptor Kit for Split/Splitless Injection			
<i>Injection Port Adaptor Kit</i>			
Kit includes: Dual Vespel Ring Inlet Seal, large bore; reducing nut, large bore; 1/16" ferrule, Vespel/graphite; 1/16" nut, stainless steel; 4mm splitless liner, intermediate polarity deactivated	kit	22426	
Micropacked Column Adaptor Kit for On-Column Injection			
<i>Injection Port Adaptor Kit</i>			
Kit includes: Dual Vespel Ring Inlet Seal, large bore; reducing nut, large bore; 1/16" ferrule, Vespel/graphite; Siltek treated metal liner installation guide; 1/16" nut, stainless steel	kit	22427	
Replacement Inlet Seals for Micropacked Column Adaptor			
Dual Vespel Ring Inlet Seals, large bore (2)	2-pk.	22429	
Replacement Metal Liner Installation Guide for On-Column Injection, Siltek Treated	ea.	22430	
Replacement 4mm Splitless Liner	ea.	20772	



Large-Bore Dual Vespel® Ring Inlet Seals



1/4" SS Nut



Large-Bore FID Adaptor



1/4" Vespel®/Graphite Ferrule



1/16" SS Nut



Large-Bore Reducing Nut



1/16" Vespel®/Graphite Ferrules



22430



20772



Looking for packed and micropacked columns?
See **pages 122-143**

also **available**

Looking for more information or products on converting packed columns to capillary columns? See pages 265-267.

Dual-Column *mini-Lam* Direct Injection Tee

- Inverted cup design offers complete sample vaporization.
- Permits larger sample volumes.
- Incorporates a Press-Tight® taper in each outlet leg, to make a perfect, dead-volume-free connection to each analytical column (ODs ranging from 0.4 to 0.8 mm).
- Allows visual confirmation of the column connection.
- Open-top design makes it easy to pack with glass wool, keeping sample residue from contaminating the cup.

Description	qty.	cat.#	price
<i>mini-Lam</i> DI Tee Kit (includes all fittings and ferrules)	kit	20436	
Replacement 4mm <i>mini-Lam</i> DI Tee	ea.	20435	



Dual-Column Direct Injection Tee

- Designed with a glass spiral to promote sample vaporization and provide even sample distribution to the two columns.
- Traps sample residue and minimizes the need for guard columns.
- Press-Tight® taper in each outlet leg facilitates a perfect dead-volume-free connection to each analytical column (OD 0.4 to 0.8 mm) and allows visual confirmation of the column connection.



20412

Description	qty.	cat.#	price
DI Tee Kit	kit	20412	
Replacement Tee	ea.	20411	

SUPPLIES & ACCESSORIES

Inlet Adaptor Kit for Dual Column Installation for Agilent Capillary Injectors

(Split/splitless fitting for capillary columns)

- 1/16-inch split/splitless fitting that accepts standard, two-hole capillary ferrules.
- Easier to install capillary columns due to the nut protruding farther from the insulated injection port chamber.
- Same column insertion depth as the original manufacturer's equipment.
- Kit includes adaptor fitting, 1/16" capillary nut, gold-plated 1.2 mm ID Dual Vespel® Ring Inlet Seal, one 0.4 mm ID two-hole ferrule, and one 0.5 mm ID two-hole ferrule.

Description	qty.	cat.#	price
Inlet Adaptor Kit for Dual Column Installation for Agilent Capillary Injectors	kit	27185	
	2-pk.	21246	
1.2mm ID Dual Vespel Ring Inlet Seal, Gold-Plated	10-pk.	21247	



27185

- The column insertion depth is the same as the original equipment.
- Kit includes adaptor fitting, capillary nut, stainless steel inlet seal, washer, and one 0.8 mm ID two-hole ferrule.
- Use recessed gooseneck liners with this adaptor.

Description	qty.	cat.#	price
1/16-Inch Capillary Inlet Adaptor Fitting Kit	kit	20645	
0.53mm ID Dual-Column Installation	2-pk.	20392	
1/16-inch ID (Opening) Replacement Inlet Seal	10-pk.	20393	



20645

Two-Hole Ferrules

for 1/8-Inch and 1/16-Inch Compression-Type Fittings

- Use 1/16-inch, two-hole ferrules with the 1/16-Inch Capillary Inlet Adaptor Fitting Kit (cat.# 27185)
- Use 1/8-inch, two-hole ferrules with the 1/8-Inch Capillary Inlet Adaptor Fitting Kit (cat.# 20645).



Fitting Size	Ferrule ID	Fits Column ID	qty.	Vespel/Graphite
1/16"	0.4mm	0.25/0.28mm	5-pk.	24848
1/16"	0.5mm	0.32mm	5-pk.	24849
1/8"	0.8mm	0.45/0.53mm	5-pk.	20246

also **available**

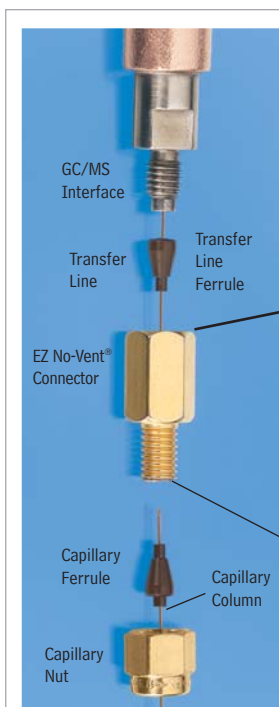
Looking for more information or products on dual column analyses?

See pages 268-270.

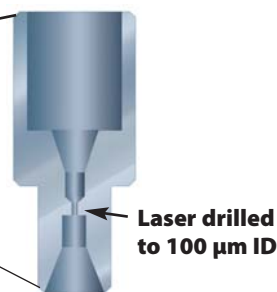
EZ No-Vent® GC Column-Mass Spectrometer Connector for Agilent GCs with 5971/5972, 5973, or 5975 GC/MS

- Change GC/MS columns in minutes without venting—100 µm transfer line throttles vacuum and eliminates the need to vent.
- Easy to install and maintain—no special tools or plumbing required.
- Gold-plated body for inertness.
- Deactivated transfer line keeps analytes focused.
- High-temperature polyimide ferrules eliminate leaks at the problematic transfer line fitting.
- Lower cost than other “no-vent” fittings.

We designed the EZ No-Vent® GC column-mass spectrometer connector to be simple and easy to use. A critical orifice in the EZ No-Vent® connector minimizes the amount of oxygen allowed into the MS source, eliminating the need for purge gas as is required for other manufacturer's vent systems. This enables you to skip the lengthy vent and pump-down cycle otherwise required when you make a column change. This can save nearly a day of down-time with each column change. The EZ No-Vent® connector easily attaches to the MS source without special tools or extra plumbing. Figure 1 shows the internal structure of the connector. Figure 2 illustrates the high performance achieved with the EZ No-Vent® Connector.



amount of oxygen entering the MS, which eliminates the need for purge gases as in other manufacturer's systems.



Change columns in minutes—without venting!

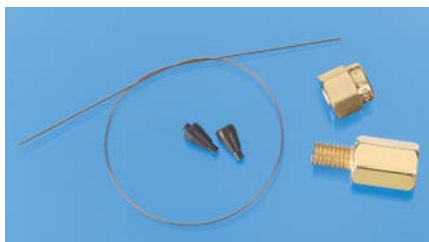
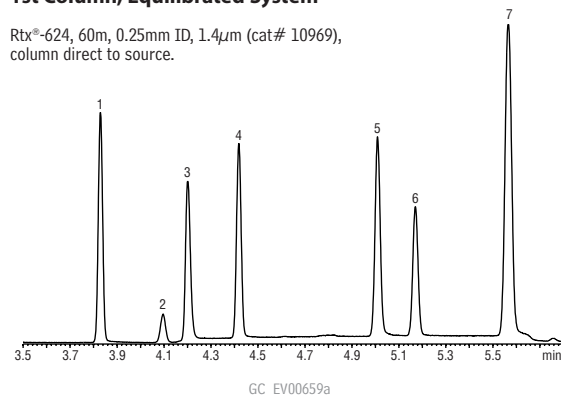


Figure 2 Sharp, symmetric peaks for gases show the EZ No-Vent® connector does not add dead volume and allows rapid column changes.

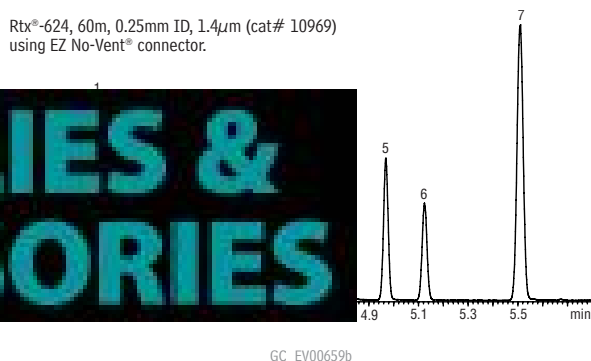
1st Column, Equilibrated System

Rtx®-624, 60m, 0.25mm ID, 1.4µm (cat# 10969), column direct to source.



Acquired 76 minutes after installing 2nd column

Rtx®-624, 60m, 0.25mm ID, 1.4µm (cat# 10969) using EZ No-Vent® connector.



1. dichlorodifluoromethane
2. 1,2-dichlorotetrafluoroethene (Freon® 114)
3. chloromethane
4. vinyl chloride
5. bromomethane
6. chloroethane
7. trichlorofluoromethane

Sample: Volatile Gas Mix 502.2 Calibration Mix#1 (gases) cat# 30042
Inj.: Purge & Trap
GC: Agilent 6890
Inj. temp.: 300°C
Carrier gas: helium, constant flow
Flow rate: 1.0mL/min.

Oven temp.: 60°C isothermal
Det: Agilent 5973 GC/MS
Transfer line temp.: 280°C
Scan range: 35-550amu
Tune: BFB
Ionization: EI

Description	qty.	cat.#	price
EZ No-Vent Connector Kit			
includes: EZ No-Vent Connector, two 0.4mm ID adaptor ferrules for capillary column, two 0.4mm ID ferrules for transfer line, 100µm deactivated transfer line (3 ft.), column plug, column nut	kit	21323	
Replacement ferrules for connecting capillary column to EZ No-Vent Connector:			
0.4mm ID (Polyimide)	2-pk.	21015	
0.5mm ID (Polyimide)	2-pk.	21016	
Replacement ferrules for connecting transfer line to EZ No-Vent Connector: 0.4mm ID	2-pk.	21043	
Replacement 100µm deactivated transfer line	3 ft.	21018	
Replacement EZ No-Vent Column Nut	20-pk.	23100	
Replacement EZ No-Vent Plug	5-pk.	23112	
Open-End Wrenches, 1/4" x 5/16"	2-pk.	20110	

restek
innovation!

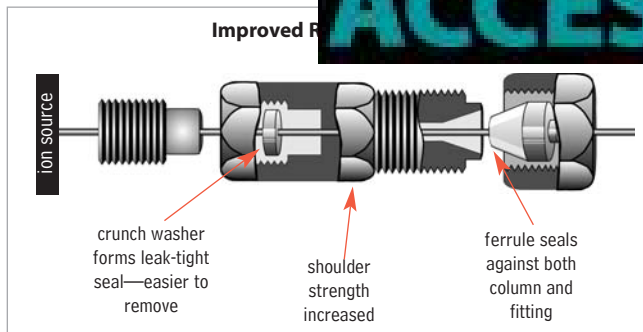
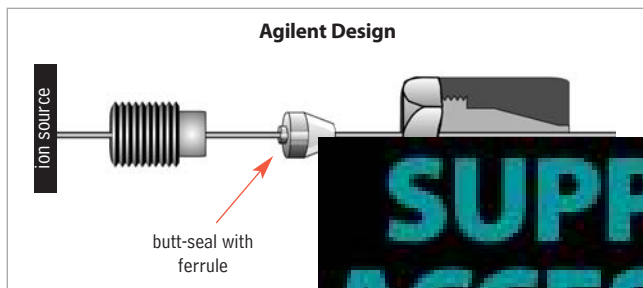
Kit installs easily, without special tools or plumbing.

Restek MSD Conversion Fitting

- A flat, soft aluminum sealing ring deforms and butt-seals against the MSD interface.
- A standard Vespel® ferrule seals the column and 1/16-inch stainless steel nut.
- Fitting is constructed of nickel-plated brass for longevity and softness.
- Use any standard Vespel® or Vespel®/graphite 1/16-inch ferrule.
- Includes a 1/16-inch stainless steel nut and two replacement sealing rings. Order ferrules separately.
- Improved design reduces chance of leaks.



Agilent's MSD interface uses a butt-seal to seal the MSD source to the capillary column. This system is prone to leakage. Restek's MSD conversion fitting is designed with two separate seals to reduce the chance of leaks: a crunch washer seals the MSD conversion fitting to the source; a ferrule seals the capillary tubing to the conversion fitting.



Description	qty.	cat.#	price
MSD Conversion Fitting	ea.	21314	
Replacement Ring Seal for MSD Conversion Fitting	2-pk.	21313	

For Vespel ferrules, see page 210.

Restek MSD Source Nut

- 1.2 mm nut bore permits easy removal of ferrules with a standard tapered-needle file (cat.# 20106).
- Made of brass to prevent thread-stripping on the transfer line.
- Design enhances ease of threading onto the transfer line and improves overall lifetime.



Description	Similar to Agilent part #	qty.	cat.#	price
(Detector) MSD Source Nut	05988-20066	2-pk.	20643	

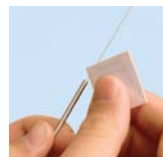
restek innovation!

Capillary Installation Gauge for Agilent 5973/5975 MS

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



Install the nut and ferrule onto the column, then insert the column through the installation tool, exposing several centimeters at the exit end.



Tighten the nut. (not depicted)



Score and remove the exposed end of the column, then loosen the nut.

Description	Similar to Agilent part #	qty.	cat.#	price
Capillary Installation Gauge for Agilent 5973/5975 MS	G1099-20030	ea.	21894	

SUPPLIES & ACCESSORIES

Gold Tip Transfer Line

- For use with Agilent 5971/5972 MS Systems.
- Gold-plated for inertness.
- Meets or exceeds original manufacturer's performance.

Description	Similar to Agilent part #	qty.	cat.#	price
Gold Tip Transfer Line	05971-20305	ea.	24699	



Replacement Interface with Bellows for Agilent 5971/5972 MS

- Meets or exceeds manufacturer's performance.
- Made of high-quality stainless steel.

Description	Similar to Agilent part #	qty.	cat.#	price
Replacement Interface with Bellows for Agilent 5971/5972 MS	05971-60302	ea.	22659	

ETP Electron Multipliers
for Mass Spectrometry

- Air stable.
- 2-year shelf life guarantee.
- Discrete dynode design results in extended operating life.

The multi-dynode approach of all ETP multipliers results in longer lifetimes and better sensitivities compared with channel multipliers because of greater surface area.



23074

The electron multipliers manufactured by ETP use a proprietary dynode material. This material has a number of properties that make it very suitable for use in an electron multiplier. It has very high secondary electron emission, which allows exceptional gain to be achieved from each dynode. This material is also very stable in air. In fact, an ETP multiplier can be stored for years before being used. As a direct result of the high stability of the active materials used in ETP multipliers, they come with a 2-year shelf life warranty (stored in original sealed package). Many testing laboratories take advantage of this long shelf life by keeping a replacement ETP multiplier on hand for future installation. This keeps the instrument

did you know?

A typical ETP electron multiplier has a total active dynode surface area of ~1,000 mm² compared to a standard continuous dynode multiplier that only has a total channel surface area of around 106 mm². The increased surface area of the ETP slows the aging process and improves operating life.

Description	qty.	cat.#	price
Electron Multipliers for Agilent GC/MS and LC/MS			
For Agilent 5970 GC/MS	ea.	23072	
For Agilent 5971, 5972, GC GC/MS	ea.	23073	
For Agilent 5973 & 5975 GC/MS			
(includes mount for initial installation)*†	ea.	23074	
For Agilent 5973 & 5975 GC/MS and LC/MSD			
(Replacement Multiplier)*†	ea.	23075	
For Agilent LC/MSD			
(includes mount for initial installation)*†	ea.	23076	

*Note: The electron multipliers have been specifically developed to retrofit the original manufacturer's equipment. The detector incorporates a modular design to facilitate ease of replacement and additional innovations intended to enhance performance. First time installation requires a mount which includes the mechanical housing. After initial installation, only the replacement electron multiplier is required.

†This unit is designed for use in the 5975, 5973 GC and the LC/MSD.



upon request. Call us if you

22660

Replacement Interface Guide Tube
for Agilent 5971/5972 MS

- Meets or exceeds manufacturer's performance.
- Made of high-quality stainless steel.

Description	Similar to Agilent part #	qty.	cat.#	price
Replacement Interface Guide Tube for Agilent 5971/5972 MS	05971-20307	ea.	22660	



22661

Replacement Cold Sensor
for Agilent 5971/5972 MS Diffusion Pump

- Meets or exceeds manufacturer's performance.
- Made of high-quality stainless steel.

Description	Similar to Agilent part #	qty.	cat.#	price
Replacement Cold Sensor for Agilent 5971/5972 MS Diffusion Pump	3103-0145	ea.	22661	



Tom Bloom, Technical Service

Technical Service

Do you have a technical question? Restek's Technical Service group has answers! Drawing from our extensive libraries of technical information and many years of collective chromatography experience, the experts in Technical Service can help you from set-up to method development.

Contact us:

For quick answers to commonly asked questions any time of the day, visit www.restek.com/answers or contact us directly:

In the U.S.

Phone: 1-800-356-1688, ext. 4
Fax: 814-353-1568
e-mail: support@restek.com

Outside the U.S.

Contact your Restek representative.



22662

Replacement Diffusion Pump Fan Assemblies for Agilent 5971/5972 MS

110/120 VAC

Description	Similar to Agilent part #	qty.	cat.#	price
Replacement Diffusion Pump Fan Assembly for Agilent 5971 MS	05971-60540	ea.	22662	
Replacement Diffusion Pump Fan Assembly for Agilent 5972 MS	05972-60540	ea.	22663	

Inland 45 is the highest quality rough pump oil you
can use for your mass spectrometer.

Inland 45 Pump Oil

Recommended for most mass spectrometers.

- Ease at cold start.
- Low vapor pressure 10^{-7} torr.
- Nontoxic and noncorrosive.
- Compatible with buna-N, neoprene and Viton® seals.
- Optimum vacuum pump performance.
- Lowest mass spectrometer background.
- Recommended for optimum mass spec performance.

Description	Similar to Agilent part #	qty.	cat.#	price
Inland 45 Pump Oil	6040-0834	1 liter	24819	

Rough Pump Oil #19

for MSD Pumps, Oil Vacuum Pump

- Formulated from crude oil stocks known for their durability and line lubricating qualities.
- Use in Agilent 5973/5972/5971 and GCD mass spec systems, or in other manufacturers' MSD systems that require rough pump oil.
- Under average use, the oil in the foreline rough pump should be replaced every six months.



22687

Description	qty.	cat.#	price
Rough Pump Oil for MSD Pumps	1 liter	22687	

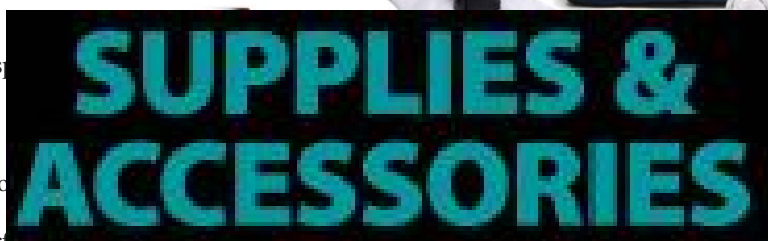
Ion Source Cleaning Powder

Use this aluminium oxide powder to clean surfaces that contact the sample or ion beam when you encounter poor sensitivity and inadequate abundances at high masses.



22685

Description	Similar to Agilent part #	qty.	cat.#	price
Ion Source Cleaning Powder	8660-0791	1 kg	22685	



your ion source.

The Restek GC/MS Cleaning Kit (cat.#s 27194, 27195) includes:

- lint free nylon gloves (small-2 pair)
- lint free nylon gloves (large-2 pair)
- lint free cotton cloth, 9 x 9 (10-pk.)
- micro mesh 4 x 6 sheet (4-pk.)
- aluminum oxide (75 gram jar)
- cotton tip applicators
- tweezers, large
- tweezers, small
- septum puller
- Dremel® tool, battery-operated (optional, 27194)
- tool kit bag

Reorder Kit (cat.# 27196) includes:

- lint free nylon gloves (small-2 pair)
- lint free nylon gloves (large-2 pair)
- lint free cotton cloth, 9 x 9 (10-pk.)
- micro mesh 4 x 6 sheet (4-pk.)

Description	qty.	cat.#	price
Mass Spec Cleaning Kit with Dremel Tool	kit	27194	
Mass Spec Cleaning Kit without Dremel Tool	kit	27195	
Mass Spec Cleaning Kit Replacement Parts Kit Includes: cloths, micro mesh sheets, small and large gloves	kit	27196	



Heater Cartridge & Platinum Resistance Thermometer (PRT) Sensor for Agilent 5890 GCs

- Use with 5890 FID and split/splitless weldments.
- Meets or exceeds original manufacturer's performance.

Description	Similar to Agilent part #	qty.	cat.#	price
Injector/FID Heater and Injector/FID PRT Sensor	05890-61140	kit	22068	
Injector/FID Heater	19231-60620	ea.	22069	
Injector/FID PRT Sensor	19231-60660	ea.	23035	

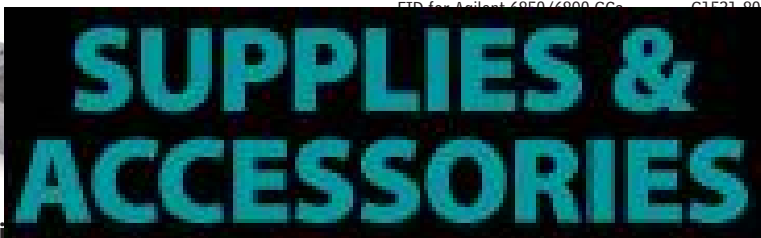


FID Base Weldment for Agilent GCs

- Meets or exceeds original manufacturer's performance.
- Includes brass nut.
- Available for Agilent 5890, 6850, or 6890 GCs.

Description	Similar to Agilent part #	qty.	cat.#	price
FID Base Weldment for Agilent 5890 GCs	19231-80580	ea.	23041	
FID Base Weldment, Pack Column FID for Agilent 6850/6890 GCs	G1531-80580	ea.	23052	
FID Base Weldment, Capillary Column FID for Agilent 6850/6890 GCs	G1531-80620	ea.	23053	

not compatible with the 7890 EPC



FID Collector Housing Kit for Agilent GCs

- Meets or exceeds original manufacturer's performance.
- Available for Agilent 5890, 6890, or 7890 GCs.

Description	Similar to Agilent part #	qty.	cat.#	price
FID Collector Housing Kit for Agilent 5890 GCs (includes collector body, spanner nut, and silicone washer—order mount separately)	19231-20920	kit	23037	
FID Collector Housing Kit for Agilent 6890/7890 GCs (includes collector body, silicone washer, nut, and mount)	G1531-20550	kit	23045	
FID Collector Housing for Agilent 6890/7890 GCs	G1531-20740	ea.	23044	
Replacement Silicone Washers for FID Collector Housing for Agilent 5890/6890/7890 GCs	5180-4165	12-pk.	23064	



FID Collector Mount for Agilent GCs

- Meets or exceeds original manufacturer's performance.
- Available for Agilent 5890, 6890, or 7890 GCs.

Description	Similar to Agilent part #	qty.	cat.#	price
FID Collector Mount for Agilent 5890 GCs	19231-20930	ea.	23036	
FID Collector Mount for Agilent 6890/7890 GCs	G1531-20550	ea.	23043	

Remove FID ignitor castle.

- Unique, ergonomic handle—easy to grip.
- Fits all instrument models.



Remove FID ignitor castle.



Easily loosen the nut by aligning the two pins on the bottom of the wrench with the two open slots on the nut...

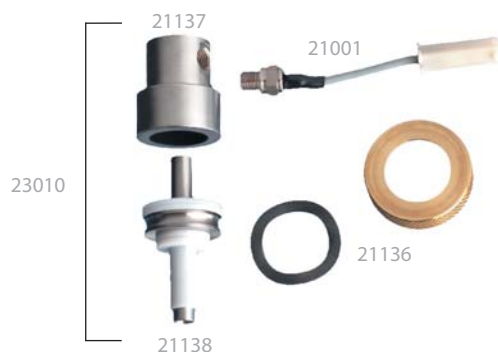


...then turn counterclockwise...



...and remove.

Description	Similar to Agilent part #	qty.	cat.#	price
Spanner Wrench for Agilent 5890/6890/6850/7890	19231-00130	ea.	22329	



FID Collector Assembly Kit for Agilent 5890 GCs

- Constructed of high-quality stainless steel.
- Meets or exceeds original manufacturer's performance.
- Individual replacement parts available.

Description	Similar to Agilent part #	qty.	cat.#	price
FID Collector Assembly Kit (includes insulators)	19231-60690	kit	23010	
FID Collector Assembly Kit w/Siltek Ignitor Castle		kit	21131	
	19231-20970, 19231-20960			
FID Collector (includes insulators)	19231-20970	ea.	21139	
FID Collector Nut and Washer	19231-20960	set	21136	
FID Ignitor*	19231-20960	ea.	21001	
FID Ignitor Castle	19231-20960	ea.	21137	
Siltek FID Ignitor Castle	19231-20960	ea.	21137	

*Also fits OI Analytical 4410 detector (siltek part # 191833).

FID Collector Assembly Kit for Agilent 6890/6850/7890 GCs

- Constructed of high-quality stainless steel.
- Meets or exceeds original manufacturer's performance.
- Individual replacement parts available.

Description	Similar to Agilent part #	qty.	cat.#	price
FID Collector Assembly Kit (includes insulator)	G1531-60690	kit	21699	
FID Collector Assembly Kit w/Siltek Ignitor Castle		kit	21132	
	G1531-60690	ea.	21139	
		set	21136	
		ea.	21001	
		ea.	21137	
		part #	191833	

SUPPLIES & ACCESSORIES



FID Flow Measuring Adaptor for Agilent 5890/6890/6850/7890 GCs

- Makes setting flows easy.
- Meets or exceeds original manufacturer's performance.

Description	Similar to Agilent part #	qty.	cat.#	price
FID Flow Measuring Adaptor	19301-60660	ea.	21000	

FID Gauge Pack for Agilent 5890 GCs

- Pressure regulators and gauges for air & hydrogen.
- 1/8-inch bulkhead allows easy hookup to instrument.
- Rated for inlet pressures to 250 psi (1,724 kPa).
- Rated for outlet pressures of 0 to 60 psi (0-414 kPa).



Description	qty.	cat.#	price
FID Gauge Pack for Agilent 5890 GCs	ea.	22071	

FID Maintenance Kit for Agilent GCs

- Include the most common consumable GC supplies and tools.
- All parts meet or exceed performance of instrument manufacturer's parts.
- Parts list makes reordering easy.

FID kits include:

- 1/4", 0.4, 0.5, and 0.8 mm ID graphite ferrules.
- FID/NPD capillary adaptor.
- Capillary nuts.
- Jet reamers/ferrule removers.
- 1/4" nut.
- Scoring wafer.
- Capillary column caps.
- Ignitor for either Agilent 5890 or 6890/6850/7890 GCs.
- FID flow measuring adaptor.
- 1/4" x 3/16" wrench.
- Installation gauge.
- Wire cleaning brush.
- High-performance Siltek® treated FID jet for either Agilent 5890 (adaptable jet) or 6890/6850/7890 (dedicated jet) GCs.
- Spanner wrench.
- FID jet removal tool.



Description	qty.	cat.#	price
FID Maintenance Kit for Agilent 5890 GCs	kit	22180	
FID Maintenance Kit for Agilent 6850/6890/7890 GCs	kit	22179	



Which FID Jet Should I Use?

There are two FID jet configurations for Agilent GCs. The longer "adaptable" jet fits both 5890 and 6890 GCs, and can be used with capillary or packed columns. The shorter "dedicated" jet is for the FID in the 6890/7890 GC that is designed only for use with capillary columns.

FID Replacement Jets

Standard Version

- Engineered with a fluted tip to guide the capillary column into the jet.
- Threads specially coated for easy installation and removal.
- Special processing ensures the highest degree of cleanliness.
- Meets or exceeds original manufacturer's performance.

High-Performance Version—Siltek® Treated

- Similar to the standard version, but Siltek® treated.
- Extremely inert, for use with active compounds.

Capillary Adaptable FID Replacement Jet for Agilent 5890/6890/6850 GCs

Description	Similar to Agilent part #	qty.	cat.#	price	qty.	cat.#	price
Standard, 0.011-Inch ID Tip	19244-80560	ea.	20670	\$56	3-pk.	20671	
High-Performance Siltek Treated, 0.011-Inch ID Tip	19244-80560	ea.	20672	\$63	3-pk.	20673	

Capillary Dedicated FID Replacement Jet for Agilent 6890/6850/7890 GCs

Description	Similar to Agilent part #	qty.	cat.#	price	qty.	cat.#	price
Standard, 0.011-Inch ID Tip	61531-80560	ea.	21621	\$46	3-pk.	21682	
					3-pk.	21683	
					3-pk.	23079	



...column applications.
...that frequently clog the
tip of smaller 0.018-inch jets.

Description	Similar to Agilent part #	qty.	cat.#	price	qty.	cat.#	price
Standard, 0.018-Inch ID Tip	18710-20119	ea.	21694	\$45	3-pk.	21695	
High-Performance Siltek Treated, 0.018-Inch ID Tip	18710-20119	ea.	21696	\$56	3-pk.	21697	

Description	Similar to Agilent part #	qty.	cat.#	price	qty.	cat.#	price
Standard, 0.030-Inch ID Tip	18789-80070	ea.	21688	\$43	3-pk.	21689	
High-Performance Siltek Treated, 0.030-Inch ID Tip	18789-80070	ea.	21686	\$56	3-pk.	21687	

FID Jet Removal Tool

for Agilent 5890/6890/6850/7890 FIDs

- Securely grips jet in socket for easy removal or installation.
- Unique, ergonomic handle—easy to hold.



Slip tool over FID jet... ...loosen jet... ...and remove.

Description	qty.	cat.#	price
FID Jet Removal Tool for Agilent 5890/6890/6850/7890 FIDs	ea.	22328	

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innovation!



22328

Torx® Screwdriver Set

- Set includes TR-10, TR-15, and TR-20.
- Ideal for performing routine maintenance on Agilent 6890 and 7890 GCs.



23034

Description	qty.	cat.#	price
Torx Screwdriver Set	set	23034	



20120

FID/Injector Cleaning Kit

The FID/Injector Cleaning Kit includes:

- Nylon tube brushes (1/8", 3/16", 1/4").
- Pipe cleaner.
- Stainless steel tube brushes (3/16", 1/4").
- Stainless steel surface brush.
- Stainless steel jet reamers.
- Emery cloth.

Description	qty.	cat.#	price
FID/Injector Cleaning Kit			



FID/NPD Adaptor Fitting

- Easy to use, sturdy, compact stainless steel fitting.
- 1/16-inch nut uses standard graphite or Vespel®/graphite ferrules.
- Wrench pad won't turn when installing a capillary column.
- Includes 1/4- and 1/16-inch stainless steel nuts, and 1/4-inch Vespel® and 0.4mm ID graphite ferrules.



20884

Description	qty.	cat.#	price
FID/NPD Adaptor Fitting	kit	20884	



22077



Injector/Detector Plug Nuts

- Use to cap off an injector to isolate leaks.
- Use to cap off a detector for thermal cleaning.
- Use to check a detector or make-up gas flow rate.
- Use to cap off a detector and prevent hydrogen from accidentally diffusing into the oven from an unused detector base.



21883

Description	Similar to Agilent part#	qty.	cat.#	price
Injector/Detector Plug Nuts	5020-8294	2-pk.	21883	

Description	Agilent part #	qty.	cat.#	price
FID/NPD Capillary Adaptor Fitting	19244-80610	ea.	22077	



21301



21302

27192

27190

ECD/FID Dual-Purpose Make-Up Gas Kit for Agilent 5890 GCs

Kit includes: replacement fitting, 1/4" nut, Vespel/graphite ferrule, 1/16" nut, 0.4 mm ID graphite ferrule, Siltek treated guide

Description	Similar to Agilent part #	qty.	cat.#	price
ECD/FID Replacement Fitting Kit with Flow Manifold Connection		kit	21301	
Replacement ECD Siltek Metal Guide		2-pk.	21302	
Replacement ECD Fused Silica Liner	19233-20625	ea.	27192	
		5-pk.	27193	
Replacement Micro ECD Liner	G2397-20540	ea.	27190	
		5-pk.	27191	

also available

Looking for more detector replacement parts?
See page 271.

Replacement Cables

for Agilent GCs, Integrators, & Autosamplers

- Considerable savings over original manufacturer's equipment.
- Instructions and wiring diagrams included.
- Manufactured with only the highest-quality components.



Connect an Agilent 5890 GC to an Agilent integrator (for second Inet integrator).

Description	Similar to Agilent part #	length	qty.	cat.#	price
Replacement Cable	35900-60610	6 ft.	ea.	20650	



Connect an Agilent 5890 GC to remote-start another piece of equipment or to start the Agilent 5890 GC from that piece of equipment.

Description	Similar to Agilent part #	length	qty.	cat.#	price
Replacement Cable	05890-61080	6 ft.	ea.	20657	



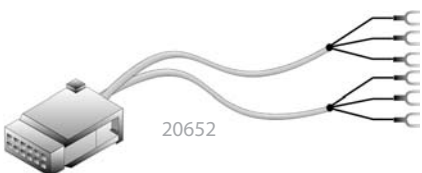
Connect an Agilent 5890 GC to an Agilent 3396 integrator to enable remote starts (non-Inet connection from GC to integrator).

Description	Similar to Agilent part #
Replacement Cable	03394-60610



Connect an Agilent 3396 integrator to remote-start another piece of equipment or to start the Agilent 3396 integrator from that other piece of equipment.

Description	Similar to Agilent part #	length	qty.	cat.#	price
Replacement Cable	03394-60540	6 ft.	ea.	20655	



Connect an Agilent 5890 GC to a non-Agilent integrator or standard strip chart recorder.

Description	Similar to Agilent part #	length	qty.	cat.#	price
Replacement Cable	05890-60800	6 ft.	ea.	20652	



Connect an Agilent 3396 integrator to a non-Agilent GC.

Description	Similar to Agilent part #	length	qty.	cat.#	price
Replacement Cable	05890-61080	6 ft.	ea.	20658	



Connect an Agilent 5890 GC to an Agilent 35900C Interface or to an Agilent 7673A Autosampler to enable remote starts.

Description	Similar to Agilent part #	length	qty.	cat.#	price
Replacement Cable	35900-60700	6 ft.	ea.	20660	



Automatic liquid sampler stop/start cable for Agilent GCs.

Description	Similar to Agilent part #	length	qty.	cat.#	price
Replacement Cable	G1530-60930	7 ft.	ea.	20929	



Connect an Agilent 6890 GC to a PC 9F/9F (RS232).

Description	Similar to Agilent part #	length	qty.	cat.#	price
Replacement Cable	G1530-60600	6 ft.	ea.	22694	

Replacement Parts for Agilent Autosamplers

All parts meet or exceed original manufacturer's performance.



Injector Mounting Posts and Parking Post for Agilent 7673 & 7683 Autosamplers

Description	Similar to Agilent part #	qty.	cat.#	price
Injector Mounting Post for Agilent 7673 Series Autosamplers for use with 6890 GCs	07673-21140	ea.	21237	
Injector Mounting Post for Agilent 7683 Series Autosamplers for use with 6850/6890 GCs	G2613-00500	ea.	21172	
Parking Post for Agilent 7673/7683 Series Autosamplers for use with 5890/6890/7890 GCs	05			



Carriage Motor Belt

for Agilent 7673A & 7683B Autosamplers

Description	Similar to Agilent part #	qty.	cat.#	price
Carriage Motor Belt for Agilent 7673A and 7673B	1500-0676	ea.	22692	



SUPPLIES & ACCESSORIES



Turret Tray Assembly for Agilent 5890/6890 GC

Holds sample, waste, and solvent vials.

Description	Similar to Agilent part #	qty.	cat.#	price
Turret Tray Assembly for Agilent 5890/6890 GC	07673-60605	ea.	22855	



Injector Turret Motor

for Agilent 7673A & 7673B Injectors

Description	Similar to Agilent part #	qty.	cat.#	price
Injector Turret Motor for Agilent 7673A & 7673B Injectors	07673-60810	ea.	22337	



Autosampler Plunger Carrier Belt for Agilent 7673A & 7673B Autosamplers




Description	Similar to Agilent part #	qty.	cat.#	price
Autosampler Plunger Carrier Belt for Agilent 7673A and 7673B	07673-61275	ea.	22695	



also **available**
Autosampler Vials

See pages 353-365.

Liners for APEX ProSep 800 & ProSep 800 Plus GCs

COLUMN INSTALLS THIS END	APEX Liners for ProSep 800 & ProSep 800 Plus GCs	Benefits/Uses:	ID* OD x Length	Similar to APEX part #	cat.#/price ea.
		injections $\leq 125\mu\text{L}$	4.0mm 6.0mm x 243mm	L-00410	21075
		injections $\leq 5\mu\text{L}$	1.0mm 6.0mm x 243mm	L-00110	21073
		injections $\leq 25\mu\text{L}$	2.0mm 6.0mm x 243mm	L-00210	21074
	MIDI II (2.0mm ID)				

*Nominal ID at syringe needle expulsion point.

Accessories
for APEX GCsViton® O-Rings
for Apex Liners

Description	Max. temp.	qty.	cat.#	price
O-Rings for APEX liners	250°C	25-pk.	22067	

Deactivated Wool

This deactivated wool is more inert than our traditional fused silica wool. This wool can be used to vaporize a sample in a liner prior to introduction into a capillary column.



Description	qty.	cat.#	price
Deactivated Wool	10 grams	24324	

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Inlet Liner Removal Tool

- Easily remove liner from inlet without burning fingers.
- Made from high-temperature resistant material.
- Won't chip or crack the liner.

Description
Inlet Liner Removal Tool








20117

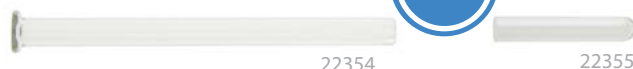
and O-rings; pointed end removes liner or debris. The tool can be used in the laboratory—can be used in the field.

Description	qty.	cat.#	price
Septum Puller	ea.	20117	

Liners for ATAS Injectors

COLUMN INSTALLS THIS END	Liners for ATAS Injectors	Benefits/Uses:	ID* OD x Length	Similar to ATAS part #	cat.#/price 5-pk.
		universal	3.0mm 5.0mm x 80mm		22415 \$25
	ATAS Open Liner, 3mm				
		trace, active samples $< 1\mu\text{L}$	1.0mm 5.0mm x 80mm	A100049	22417 \$42
	ATAS Open Liner, 1mm				
		dirty samples	3.0mm 5.0mm x 80mm	A100126	22419 \$40
	ATAS Fritted Gooseneck				
					
	Liners for ATAS LINEX DMI System OPTIC 2 and 3 inlets				
			ID* OD x Length 3.3mm 5.0mm x 81mm		cat.#/price 5-pk. 22353
	ATAS LINEX DMI Liner				









*Nominal ID at syringe needle expulsion point.






Accessories
for ATAS LINEX DMI System





Description	qty.	cat.#	price
Needle Guide for ATAS LINEX DMI Liner	5-pk.	22354	
Microvial/Insert for ATAS LINEX DMI Liner	100-pk.	22355	

ordering **note**

For additional liner ordering information, see **pages 206-213**.

Split Liners for PerkinElmer GCs	Benefits/Uses:	ID* OD x Length	Similar to PE part #	ea.	cat.#/price 5-pk.	25-pk.
 Straight	universal, for most common analyses	3.5mm 5.0mm x 100mm	N6502008	20736	20737	—
 Cup Splitter	high & low MW compounds	3.5mm 5.0mm x 100mm	—	20739	20740	—
 Cyclosplitter	dirty samples, many injections before cleaning required	3.5mm 5.0mm x 100mm	—	20745	20746	—
 Auto SYS Splitter w/Wool	universal for most common analyses	4.0mm 6.2mm x 92.1mm	N6502009	20832	20833	20834
 Auto SYS Cup Splitter	high & low MW compounds	4.0mm 6.2mm x 92.1mm	N6502011	20835	20836	—
 Auto SYS Cyclosplitter	dirty samples, many injections before cleaning required	4.0mm 6.2mm x 92.1mm	N6502012	20910	20911	—
 Auto SYS Laminar Cup Splitter	high MW compounds	4.0mm 6.2mm x 92.1mm	—	20827	20828	—
 Auto SYS Split Precision Liner w/Wool	dirty samples, trace samples	4.0mm 6.2mm x 92.1mm	N6121020	21026	21027	—

Splitless Liners for PerkinElmer GCs	Benefits/Uses:	ID* OD x Length	Similar to PE part #	ea.	cat.#/price 5-pk.	25-pk.
 Splitless (2mm ID)					20731	20732
 Auto SYS Splitless					21273	21274
 Auto SYS Splitless (2mm ID) w/Wool					20830	—
 Auto SYS Double Gooseneck	trace, active samples up to 4µL	4.0mm 6.2mm x 92.1mm	N6502003	20853	20854	—
 Auto SYS Cyclo Double Gooseneck	trace, dirty, active samples, up to 4µL	4.0mm 6.2mm x 92.1mm	N6502005	20899	20900	—

PSS Liners for PerkinElmer GCs	Benefits/Uses:	ID* OD x Length	Similar to PE part #	ea.	cat.#/price 5-pk.	25-pk.
 PSS Split/Splitless (1mm ID)	trace samples	1.0mm 4.0mm x 86.2mm	N6121006	20738	20741	—
 Auto SYS XL PSS Split/Splitless w/Wool	most common analyses	2.0mm 4.0mm x 86.2mm	N6121004	21717	21718	—
 PSS Drilled Uniliner (hole near top)	trace, active samples, high recovery & linearity	2.0mm 4.0mm x 86.2mm		22986	22987	—
 PSS Drilled Uniliner (hole near bottom)	trace, active samples, high recovery & linearity	2.0mm 4.0mm x 86.2mm		22988	22989	—

*Nominal ID at syringe needle expulsion point.

All liners are
100%
deactivated

All liners are shipped intermediate polarity (IP) deactivated unless otherwise requested.

Sky
Inlet Liners

Introducing **Sky™** Liners



See page 206 for more details.

RESTEK

HRMalytic +61(0)3 9762 2034
ECHnology Pty Ltd

Australian Distributors
Importers & Manufacturers
www.chromtech.net.au















11/12

www.restek.com

245



COLUMN INSTALLS THIS END

Zero Dilution Liners for PerkinElmer Auto SYS and Clarus GCs		Benefits/Uses:	ID* OD x Length	Similar to PE part #	ea.	cat.#/price 5-pk.	25-pk.
		headspace analysis	1.0mm 2.0mm x 73mm	N1011446	22990	22991	—
Zero Dilution Inner Liner							
		headspace analysis	2.5mm 6.2mm x 90mm	N1011445	22992	22993	—
Zero Dilution Outer Liner							
Zero Dilution Liners for PerkinElmer GCs with PSS Inlets		Benefits/Uses:	ID* OD x Length	Similar to PE part #	ea.	cat.#/price 5-pk.	25-pk.
		headspace analysis	1.0mm 2.0mm x 73mm	N1011446	22990	22991	—
Zero Dilution Inner Liner							
		headspace analysis	2.5mm 4.2mm x 83mm	N1011447	24978	24979	—
Zero Dilution Outer Liner							
PTV Liners for PerkinElmer GCs		Benefits/Uses:	ID* OD x Length	Similar to PE part #	ea.	cat.#/price 5-pk.	25-pk.
		high linearity for 0.25, 0.32, & 0.53mm ID columns	1.0mm 2.0mm x 88mm	—	20733	20734	20735
PTV Press-Tight							
		high linearity	1.0mm 2.0mm x 88mm	—	20742	20743	20744
1.0mm PTV Liner							
DI Liners for PerkinElmer GCs (0.32/0.53mm ID)		Benefits/Uses:	ID* OD x Length	Similar to PE part #	ea.	cat.#/price 5-pk.	25-pk.
						20856	—
Uniliner							
						20858	—
Cyclo-Uniliner							
						20838	—
Auto SYS Open-top Uniliner w/Valve							
		trace, dirty, high MW active samples, high linearity	4.0mm 6.2mm x 92.1mm	N6502017	20839	20840	—
Auto SYS Cyclo-Uniliner							
DI Liners for PerkinElmer GCs (For 0.32/0.53mm ID Columns)		Benefits/Uses	ID* OD x Length	Similar to PE part #	ea.	cat.#/price 5-pk.	25-pk.
		trace, active samples, high recovery & linearity	4.0mm 6.2mm x 92.1mm	N6121022	20819	20822	—
Auto SYS Drilled Uniliner (hole near top)							
		trace, active samples, high recovery & linearity	4.0mm 6.2mm x 92.1mm	N6502013	21293	21294	—
Auto SYS Drilled Uniliner (hole near bottom)							
		trace, active samples, high recovery & linearity	4.0mm 6.2mm x 92.1mm	N6502014	21295	21296	—
Auto SYS Gooseneck Drilled Uniliner (hole near top)							
		trace, active samples, high recovery & linearity	4.0mm 6.2mm x 92.1mm	N6502015	21297	21298	—
Auto SYS Gooseneck Drilled Uniliner (hole near bottom)							

*Nominal ID at syringe needle expulsion point.

SUPPLIES & ACCESSORIES

Graphite O-Rings

for PerkinElmer Auto SYS XL or Clarus GCs with PSS Injector

Description	Max. temp.	Similar to PE part #	qty.	cat.#	price
Graphite O-Rings for PerkinElmer Auto SYS XL or	450°C	N610-1751	10-pk.	21475	
Clarus GCs w/PSS Injector	450°C	N610-1751	25-pk.	21476	

Viton® O-Rings

for PerkinElmer PSS Injector

Description	Max. temp.	Similar to PE part #	qty.	cat.#	price
Viton O-Rings for PerkinElmer PSS Injector	250°C	N6101747	10-pk.	20366	

Silicone O-Rings

for PerkinElmer Auto SYS XL or Clarus with CAP Injector

Description	Max. temp.
Silicone O-Rings for PerkinElmer Auto SYS XL or Clarus with CAP Injector	250°C

IceBlue®



BTO®

Thermolite®

Septa (11mm)

for PerkinElmer GCs

- Preconditioned and ready to use.
- Packaged in precleaned glass jars.

Thermolite Septa usable to 340°C inlet temp.			IceBlue Septa usable to 250°C inlet temp.			BTO Septa usable to 400°C inlet temp.		
qty.	cat.#	price	qty.	cat.#	price	qty.	cat.#	price
25-pk.	27141		50-pk.	27162		50-pk.	27110	
50-pk.	27142		100-pk.	27163		100-pk.	27111	
100-pk.	27143							

HANDY
septum size chart

PerkinElmer Instrument	Septum Diameter (mm)
Sigma series	11
900,990	11
8000 series	11
Auto SYS	11
Auto SYS XL	11



also **available**

Looking for packed column parts for PerkinElmer instruments?

See pages 265-267.

Merlin Microseal Septa

for PerkinElmer GCs
350 °C max injection port temperature.



The advantages of the Merlin Microseal Septum include elimination of septum coring, longer life, and consistent low needle insertion force. The Microseal septum incorporates two separate sealing mechanisms. These sliding seals eliminate septum coring and the resulting accumulation of septum crumbs in the injection port liner.

The Microseal septum uses a 23 gauge (0.63 mm, .025") needle or probe with a blunt, truncated conical tip. Since the syringe plunger end details are determined by manual or autosampler compatibility, often a removable needle syringe is an effective way to match both of these requirements. Installation is simple, requiring no modification of the injection port.

22781

Microseal Septa for PerkinElmer GCs	Merlin#	Similar to PE#	cat.#	price
PerkinElmer Kit (septum cap adapter, O-ring, nut, 2 septa)	51-12w	N9303344	22781	
		PE# N9303345	22782	



Injector Adaptor

for PerkinElmer Auto SYS XL

- Made of high-quality stainless steel.
- Meet or exceed original manufacturer's performance.
- Siltek® treated version available for increased inertness.

Description	Similar to PE part #	qty.	cat.#	price
For use with PE style capillary nuts				
Injector Adaptor for PerkinElmer Auto SYS XL	N6100157	ea.	22318	
Siltek Treated Injector Adaptor for PerkinElmer Auto SYS XL	—	ea.	22320	
For use with 1/8" compression style nuts				
Injector Adaptor for PerkinElmer Auto SYS XL	—	ea.	22319	

22320



FID Capillary Column Adaptor

for PerkinElmer Auto SYS XL

- Made of high-quality stainless steel.
- Meet or exceed original manufacturer's performance.

Description	Similar to PE part #	qty.	cat.#	price
For use with PE style capillary nuts				
FID Capillary Column Adaptor for PerkinElmer Auto SYS XL	N6120020	ea.	22608	
For use with 1/8" compression style nuts				
FID Capillary Column Adaptor for PerkinElmer Auto SYS XL		ea.	22609	

22608

22609





23038

FID Replacement Parts

for PerkinElmer Auto SYS XL and Clarus 500

- Made of high-quality stainless steel.
- Meet or exceed original manufacturer's performance.

Description	Similar to PE part #	qty.	cat.#	price
FID Jet for PerkinElmer Auto SYS XL and Clarus 500	N6100361	ea.	23038	
Auto-Ignite FID Replacement Part Kit for PerkinElmer Auto SYS XL and Clarus 500	N6103167, N6103175, N6101085, N6001204, 09912223	kit	23061	
Nozzle Insulator for PerkinElmer Auto SYS XL and Clarus 500	N6101085	ea.	23062	
FID Body for PerkinElmer Auto SYS XL and Clarus 500	N6100364	ea.	23063	



22185

Everything you need
in one complete kit!

Make Life Easier (MLE) Capillary Tool Kit

for PerkinElmer GCs



No more burned
fingers!

26261

The Claw and The Claw Holder Kit

- Easily removes hot liners from injection ports.
- 4mL vials (not included) can be replaced when dirty.

Never again will you have to burn your fingers removing a hot injection port liner. The Claw safely and cleanly removes liners, O-rings, or other small objects from the injection port. You can then place the hot objects in a clean 4 mL vial situated in the Claw holder until ready for reuse.



Description	qty.	cat. #	price
The Claw	ea.	26261	
The Claw Holder Kit (includes The Claw and holder)	kit	26262	
WISP 48 Snap Seal Vial	100-pk.	24658	

- liner removal tool
- obtum puller
- mini wool puller/insertor tool
- pinch tapered needle file
- level head flashlight
- mini hand drill set
- 15cm compact steel ruler
- pocket magnifier
- high temperature string (1 meter)
- pipe cleaner (12-inch)
- cotton tip swabs (pk. of 25)

Description	qty.	cat.#	price
MLE Capillary Tool Kit	kit	22185	



20387

Open-End Wrench Set

















High-quality 1/4" x 3/16", 3/8" x 7/16", 7/16" x 1/2", and 1/2" x 9/16" wrenches for tightening a wide variety of chromatography fittings.

Description	qty.	cat.#	price
Open-End Wrench Set	set	20387	

also available

Restek carries Swagelok® fittings in brass & stainless steel. See pages 313-315 or visit www.restek.com and search on Swagelok.











Split Liners for Shimadzu 14A GCs	Benefits/Uses:	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.#/price 5-pk.	25-pk.
 Split	universal, for most common analyses	3.5mm 5.0mm x 99mm	221-32544-01	20860	20861	20862
 Cyclo splitter	dirty samples, many injections before cleaning required	3.5mm 5.0mm x 99mm	—	20870	20871	—
 Laminar Cup Splitter	high MW compounds	3.5mm 5.0mm x 99mm	—	20868	20869	—
Splitless Liners for Shimadzu 14A GCs	Benefits/Uses:	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.#/price 5-pk.	25-pk.
 3.5mm Splitless	trace samples	3.5mm 5.0mm x 99mm	221-32544-00	20863	20864	20865
DI Liners for Shimadzu 14A GCs (0.25/0.32/0.53mm ID)	Benefits/Uses	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.#/price 5-pk.	25-pk.
 Uniliner	trace, active samples, high recovery & linearity	3.5mm 5.0mm x 99mm	—	20876	20877	—
 Cyclo-Uniliner	trace, dirty, high MW active samples, high recovery & linearity	3.5mm 5.0mm x 99mm	—	20893	20894	—
Split Liners for Shimadzu 17A, 2010, and 2014 GCs	Benefits/Uses:	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.#/price 5-pk.	25-pk.
 1mm Split		3.5mm 5.0mm x 95mm	—	22023	20977	20978
 3.5mm Split					22284	22285
 2mm Split Precision Liner w/Wool					22172	—
 3.5mm Split Precision Liner w/Wool					21021	—
 Single Gooseneck w/Wool					22173	22174
 Cyclo splitter	dirty samples, many injections before cleaning required	3.5mm 5.0mm x 95mm	—	22072	22073	—
Splitless Liners for Shimadzu 17A, 2010, and 2014 GCs	Benefits/Uses:	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.#/price 5-pk.	25-pk.
 2mm Gooseneck Splitless	universal, trace samples	2.0mm 5.0mm x 95mm	—	22276	22277	—
 3.5mm Gooseneck Splitless	universal, trace samples	3.5mm 5.0mm x 95mm	221-48335-01	22286	22287	—
 Double Gooseneck Splitless	reduces backflash and catalytic decomposition	3.5mm 5.0mm x 95mm	—	22274	22275	—

*Nominal ID at syringe needle expulsion point.

All liners are
100%
deactivated

All liners are shipped intermediate polarity (IP) deactivated unless otherwise requested.

COLUMN INSTALLS THIS END

Split/Splitless Liners for Shimadzu 17A, 2010, and 2014 GCs	Benefits/Uses:	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.#/price 5-pk.	25-pk.
 Split/Splitless w/Wool	universal, for most common analyses	3.5mm 5.0mm x 95mm	221-41444-00	20955	20956	20957
SPME Liner for Shimadzu 17A, 2010, and 2014 GCs	Benefits/Uses	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.#/price 5-pk.	25-pk.
 SPME Liner	ideal for low volume SPME applications	0.75mm 5.0mm x 95mm		22278	22279	—
Liners for Shimadzu 17A PTV GCs	Benefits/Uses	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.#/price 5-pk.	25-pk.
 17A PTV Liner w/Wool	trace, dirty, high & low MW active samples	1.6mm 4.0mm x 95mm	225-09212-01	21705	21706	21707
DI Liners for Shimadzu 17A, 2010, and 2014 GCs (0.25/0.32/0.53mm ID)	Benefits/Uses	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.#/price 5-pk.	25-pk.
 Uniliner w/Wool	trace, dirty, high MW active samples, high recovery & linearity	3.5mm 5.0mm x 95mm	—	21713	21719	—
 Open-top Drilled Uniliner (hole near top)	trace, active samples, high recovery & linearity	3.5mm 5.0mm x 95mm	—	21285	21286	—
 Open-top Drilled Uniliner (hole near bottom)					21288	—
 Gooseneck Drilled Uniliner (hole near top)					21290	—
 Gooseneck Drilled Uniliner (hole near bottom)					21292	—

*Nominal ID at syringe needle attachment point

SUPPLIES & ACCESSORIES

Sky
Inlet Liners

Introducing **Sky™ Liners**



See page 206 for more details.

Siltek® Treated Metal Inlet Liners for Shimadzu GCs

- Won't crack, chip, or break like glass liners.
- Excellent response for pesticides, phenols, and other active compounds.

Liner Type (3.5mm ID x 5.0mm OD x 95mm)	qty.	cat.#	price
95mm Split/Splitless w/Wool, Siltek, Metal	5-pk.	21003	



Viton® O-Rings

for Shimadzu 17A, 2010, and 2014 GCs

Description	Max. temp.	Similar to Shimadzu part #	qty.	cat.#	price
Viton O-Rings for Shimadzu 17A, 2010, and 2014 GCs	250°C	036-11203-84	10-pk.	24899	

Graphite O-Rings

for Shimadzu 2010, and 2014 GCs

Description	Max. temp.	Similar to Shimadzu part #	qty.	cat.#	price
Graphite O-Rings for Split Liners	450°C	221-48393-91	5-pk.	20243	
Graphite O-Rings for Splitless Liners	450°C	221-47222-91	5-pk.	20244	

Septa (Plug)

for Shimadzu GCs

Thermolite Septa usable to 340°C inlet temp.			IceBlue Septa usable to 250°C inlet temp.		
qty.	cat.#	price	qty.	cat.#	price
25-pk.	27153		50-pk.	27154	
50-pk.	27154		100-pk.	27155	
100-pk.	27155				

SUPPLIES & ACCESSORIES



Septum Nut

for Shimadzu 17A, 2010, and 2014 GCs

- One piece design for ease of installation and removal.
- Made of clear anodized aluminum and high-quality stainless steel.

Description	Similar to Shimadzu part #	qty.	cat.#	price
Septum Nut for Shimadzu 17A, 2010, and 2014 GCs	221-41286-00, 221-44584-00	ea.	22079	



Injector Nut Kit

for Shimadzu 17A, 2010, and 2014 GCs

Includes 17A injector nut, 0.4 mm graphite ferrule, and 1/16-inch stainless steel capillary nut.

Description	qty.	cat.#	price
Injector Nut Kit for Shimadzu 17A, 2010, and 2014 GCs	kit	21895	
Siltek Treated Injector Nut Kit for Shimadzu 17A, 2010, and 2014 GCs	kit	22331	



Capillary Nut

for Shimadzu 17A, 2010, and 2014 GCs

Meets original manufacturer's performance.

Description	Similar to Shimadzu part #	qty.	cat.#	price
Capillary Nut for Shimadzu 17A, 2010, and 2014 GCs	221-41533-00	2-pk.	22688	



Restek Enhanced Capillary Nut

for Shimadzu 17A, 2010, and 2014 GCs

- Restek's design eliminates the slot, increasing lifetime and

performance.

qty.	cat.#	price
2-pk.	20375	



5 mm Ferrules

for Shimadzu 17A GCs

- For use with packed columns.
- Graphite construction.

Description	qty.	cat.#	price
5mm Ferrules for Shimadzu 17A GCs	10-pk.	21121	



Graphite Ferrules

for Shimadzu 17A, 2010, & 2014 GCs

- Graphite 2-piece construction.
- Available in 0.4, 0.5, and 0.8 mm sizes.
- Packaged on mandrel for easy handling.

Ferrule ID	Fits Column ID	Similar to Shimadzu part #	qty.	cat.#	price
0.4mm	0.25mm and less	220-90765-00	10-pk.	24827	
0.5mm	0.32mm	221-32126-05	10-pk.	24828	
0.8mm	0.53mm	221-32126-08	10-pk.	24829	



Injector Wrench

for Shimadzu 17A, 2010, and 2014 GCs

- Designed specifically for removing Shimadzu injection ports.
- High-quality stainless steel construction.

Description	Similar to Shimadzu part #	qty.	cat.#	price
Injector Wrench for Shimadzu 17A, 2010, and 2014 GCs	221-46977-00	ea.	21159	



Open-End Wrench Set

for use with Shimadzu 17A, 2010, and 2014 Capillary Installation Gauge

Description	qty.	cat.#	price
1/4" x 3/16" and 10mm x 11mm Open-End Wrench Set for use with Shimadzu 17A, 2010, and 2014 Capillary Installation Gauge	ea.	22334	



Capillary Installation Gauge

for Shimadzu 17A, 2010, & 2014 GCs

- Seats ferrule onto column for consistent installations
- Prevents crushed column
- Made from high-quality stainless steel
- For use with graphite ferrules

Description

Capillary Installation Gauge for Shimadzu 17A, 2010, and 2014 GCs

SUPPLIES & ACCESSORIES



Everything you need
in one complete kit!

22182

Make Life Easier (MLE) Capillary Tool Kit for Shimadzu GCs

Includes:

- capillary installation gauge for Shimadzu GCs
- injector wrench for Shimadzu GCs
- 1/8", 3/16", and 1/4" nylon brushes
- 1/4", 3/8", and 3/16" stainless steel wire tube brushes
- stainless steel surface brush
- 6 stainless steel jet reamers (0.25–0.65 mm OD)
- 1/4" x 3/16" open end wrench
- 3/8" x 1/16" open end wrench
- 6 mm x 7 mm open end wrench
- 8 mm x 10 mm open end wrench
- 16 mm x 17 mm open end wrench
- rubber-tipped slide-lock tweezers
- scoring wafers with handles
- inlet liner removal tool
- septum puller
- mini wool puller/insertor tool
- 4-inch tapered needle file
- swivel head flashlight
- mini hand drill set
- 15 cm compact steel ruler
- pocket magnifier
- high temperature string (1 meter)
- pipe cleaner (12-inch)
- cotton tip swabs (pk. of 25)




Description	qty.	cat.#	price
MLE Capillary Tool Kit for Shimadzu GCs	kit	22182	






did you **know?**







Restek offers a full line of Parker® gas generators.





Gas generators are a safe and cost-effective alternative to gas cylinders. See **pages 304-308** for more information.

Split Liners for Thermo Scientific 4000-5000-6000 Series GCs	Benefits/Uses:	ID* OD x Length	Similar to TS part #	ea.	cat.#/price 5-pk.	25-pk.
	high MW compounds	4.0mm 5.4mm x 79.5mm	—	20809	20810	—
Laminar Cup Splitter						
	dirty samples, many injections before cleaning required	4.0mm 5.4mm x 79.5mm	—	20817	20818	—
Cyclosplitter						
	high & low MW compounds	4.0mm 5.4mm x 79.5mm	—	20885	20886	—
Cup Splitter Gooseneck						

Splitless Liners for Thermo Scientific 4000-5000-6000 Series GCs	Benefits/Uses:	ID* OD x Length	Similar to TS part #	ea.	cat.#/price 5-pk.	25-pk.
	trace samples	2.0mm 5.4mm x 79.5mm	—	20811	20812	20813
Splitless (2mm ID)						
	trace samples	4.0mm 5.4mm x 79.5mm	—	20814	20815	20816
Splitless (4mm ID)						

DI Liners for Thermo Scientific 4000-5000-6000 Series GCs (0.32/0.53 ID)	Benefits/Uses:	ID* OD x Length	Similar to TS part #	ea.	cat.#/price 5-pk.	25-pk.
	trace, dirty, active samples, high recovery & linearity	4.0mm 5.4mm x 79.5mm	—	20841	20842	—
Open-top Uniliner w/Wool						

Split Liners for Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL		ID* OD x Length	Similar to TS part #	ea.	cat.#/price 5-pk.	25-pk.
					20917	—
1mm Split						
					20937	20938
3mm Split						
					20940	20941
5mm Split						
	high MW compounds	4.0mm 8.0mm x 105mm	—	20948	20949	—
Laminar Cup Splitter						
	high & low MW compounds	4.0mm 8.0mm x 105mm	—	20950	20951	—
Cup Splitter						
	dirty samples, trace samples	5.0mm 8.0mm x 105mm	—	22288	22289	—
5mm Split Precision Liner w/Wool						







Splitless Liners for Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL	Benefits/Uses:	ID* OD x Length	Similar to TS part #	ea.	cat.#/price 5-pk.	25-pk.
	trace samples	3.0mm 8.0mm x 105mm	453 20032	20942	20943	20944
Splitless (3mm ID)						
	trace samples	5.0mm 8.0mm x 105mm	453 20033	20945	20946	20947
Splitless (5mm ID)						
	trace, active samples up to 4µL	4.0mm 8.0mm x 105mm	—	20952	20953	—
Double Gooseneck						
	dirty samples, trace samples	5.0mm 8.0mm x 105mm	—	21028	21029	—
5mm Splitless Precision Liner w/Wool						

*Nominal ID at syringe needle expulsion point.

All liners are
100%
deactivated

All liners are shipped intermediate
polarity (IP) deactivated unless
otherwise requested.

COLUMN INSTALLS THIS END

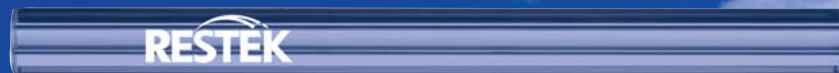
Split Liners for Thermo Scientific TRACE PTV		Benefits/Uses:	ID* OD x Length	Similar to TS part #	ea.	cat.#/price 5-pk.	25-pk.
	1mm ID Glass Liner	trace samples, high recovery & linearity	1.0mm	453 22054	21114	21115	—
			2.75mm x 120mm				
	2mm ID Glass Liner	universal	2.0mm	453 22045	21116	21117	—
			2.75mm x 120mm				
	Baffle Liner	trace samples	2.0mm	—	22074	22075	—
			2.75mm x 120mm				
DI Liners for Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL (0.32 & 0.53mm ID columns)		Benefits/Uses:	ID* OD x Length	Similar to TS part #	ea.	cat.#/price 5-pk.	25-pk.
	Uniliner w/Wool	trace, active samples, high recovery, & linearity	5.0mm	—	21005	21006	—
			8.0mm x 105mm				
	Drilled Uniliner (hole near top)	trace, active samples, high recovery, & linearity	5.0mm	—	22411	22412	—
			8.0mm x 105mm				
	Drilled Uniliner (hole near bottom)	trace, active samples, high recovery, & linearity	5.0mm	—	22413	22414	—
			8.0mm x 105mm				

*Nominal ID at syringe needle expulsion point.

SUPPLIES & ACCESSORIES

Sky
Inlet Liners

Introducing Sky Liners



See page 206 for more details.

Siltek® Treated Metal Inlet Liners for Thermo Scientific GCs

- Won't crack, chip, or break like glass liners.
- Excellent response for pesticides, phenols, and other active compounds.

Liner Type (5.0mm ID x 8.0mm OD x 105mm)	ea./price	5-pk./price
5mm ID Split/Splitless w/Wool	—	21004
Liner Type (2.75mm OD x 120mm)	ea./price	5-pk./price
1mm ID Split/Splitless**	21080	21081
2mm ID Split/Splitless**	21082	21083
Liner Type (0.8mm ID x 2.75mm OD x 120mm)	ea./price	5-pk./price
SPME for TRACE 2000 GCs & PTV Inlets	22598	22599

**Works with PTV injectors.



Inlet Liner Seals

for Thermo Scientific TRACE PTV



Description	Max. temp.	Similar to TS part #	qty.	cat.#	price
Inlet Liner Seals for Thermo Scientific TRACE PTV	450°C	29013417	2-pk.	21392	

Graphite Sealing Ring

for Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL Instruments



Description	Max. temp.	Similar to TS part #	qty.	cat.#	price
Graphite Sealing Ring for Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL	450°C	290-334-06	ea.	21898	
	450°C	290-334-06	2-pk.	21899	

Septum Cap

for Split/Splitless Injector on Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL



Description	Similar to TS part #	qty.	cat.#	price
Septum Cap for Split/Splitless Injector on Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL	350 01 050	ea.	24971	

**Septa Holder Kits**

for Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL

- Includes septum support and holder.
- Made from high-quality stainless steel.
- Silcosteel®-AC treated version helps with septum removal.

Septa (9.5 mm, 17 mm)

for Thermo Scientific GCs

- Preconditioned and ready to use
- Packaged in precleaned glass

Septum Diameter	25-pk./price
BTO Septa (usable to 400°C inlet temp.)	
9mm CenterGuide	—
9.5mm (3/16")	—
17mm CenterGuide	—

Due to the injection port temperatures, Restek recommends using only BTO septa in Thermo Scientific instruments.

HANDY
septum
size chart

Instrument	Septum Diameter (mm)
Thermo Scientific TRACE GC, 8000, 8000 TOP, GCQ w/TRACE, PTV, 8000 series	17
Finnigan (TMQ) GC 9001, GCQ, QCQ, TRACE 2000	9.5

SUPPLIES & ACCESSORIES

qty.	cat.#	price
kit	21299	
kit	24972	

Gold-Plated Liner Cap

for Split/Splitless Injector on Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL



Description	Similar to TS part #	qty.	cat.#	price
Gold-Plated Liner Cap for Split/Splitless Injector on Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL	290 042 90	ea.	22089	

22089



Lab Gas Issues?

Restek has the solution!

The ProFLOW 6000 Electronic Flowmeter measures volumetric flow for gases across a range of 0.5-500 mL/min.

See **page 274** for more information.

Silver Seals

for Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL



Description	Similar to TS part #	qty.	cat.#	price
Silver Seal	29033629	10-pk.	23057	
for Split/Splitless Injector	29033629	20-pk.	23058	

23057

**Adapters for Capillary Columns**

on Thermo Scientific TRACE and Focus SSL

- Use same installation distance as manufacturer's adaptors.
- Made of high-quality stainless steel.
- Siltek® treated version available for additional inertness.

Description	Similar to TS part #	qty.	cat.#	price
For use with standard 1/8" ferrules.				
Adaptor for Capillary Column on Detector Base		ea.	24916	
Adaptor for Capillary Column on Split/Splitless Injector				
Siltek Treated Adaptor for Capillary Column on Split/Splitless Injector				
For use with M4 ferrules.				
Adaptor for Capillary Column on Detector Base				
Adaptor for Capillary Column on Split/Splitless Injector				
Siltek Treated Adaptor for Capillary Column on Split/Splitless Injector		ea.	20544	

Nut for Terminal Fitting
for Thermo Scientific TRACE GCs

Description	Similar to TS part #	qty.	cat.#	price
Nut for Terminal Fitting for Thermo Scientific TRACE GCs	350 221 25	2-pk.	24896	

Fixing Nut for Capillary Column
for Split/Splitless Injector on Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL

Made of high-quality stainless steel.

Description	Similar to TS part #	qty.	cat.#	price
Fixing Nut for Capillary Column for Split/Splitless Injector on Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL	350 32 423	5-pk.	24973	

Graphite Ferrules

(M4 Fittings) for Thermo Scientific TRACE, 8000, 8000 TOP & Focus GCs



Ferrule ID	Fits Column ID	Similar to TS part #	Graphite 2-pk. price	Graphite 10-pk. price
0.3mm	0.10/0.15mm	—	22221	22222
0.4mm	0.18/0.28mm	29013488 (2-pk.) 29053488 (10-pk.)	20280	20281
0.5mm	0.32mm	29013487 (2-pk.) 29053487 (10-pk.)	20282	20283
0.8mm	0.45/0.53mm	29013486 (2-pk.) 29053486 (10-pk.)	20284	20285

FID Jet

for Thermo Scientific TRACE and Focus GCs

Meets or exceeds original manufacturer's



qty.	cat.#	price
ea.	23080	

SUPPLIES & ACCESSORIES

Restek Electronic Leak Detector**Protect your GC and analytical column!**

Don't forget to leak check after connecting all adaptors and fittings. The Restek Electronic Leak Detector will help ensure a leak-free connection!

See page 204.www.restek.com/leakdetector

Liner Cap Removing Tool

for Thermo Scientific GCs: Focus GC / TRACE GC / Ultra/TRACE GC x GC

- Easily loosens the liner cap from the injector.
- Unique, ergonomic handle—easy to grip.



24937



Remove septum cap, septum holder, septum, and septum support.



Place tool on liner cap. Align two pins on bottom of tool with two open slots on liner cap.



Turn counter-clockwise to loosen liner cap.



Use tweezers (cat. #20101) to remove liner cap.

Description
Liner Cap Removing Tool
for Thermo Scientific GCs

Size

2



22330

Capillary Installation Gauge

for Thermo Scientific TRACE and Focus SSL (M4 Ferrules)

- Seats ferrule onto column for consistent installations.
- Prevents crushed column ends.
- Made from high-quality stainless steel.



Install nut and ferrule onto column. Cut column end squarely. Slide column into installation gauge to recommended insertion distance. Finger-tighten column nut.

Tighten assembly to ensure a properly seated ferrule. Loosen assembly and remove column and column nut.

The ferrule will be properly seated, and should remain in place when light force is applied. If it slides loosely on the column, repeat procedure.

Description	qty.	cat.#	price
Capillary Installation Gauge for Thermo Scientific TRACE & Focus SSL (M4 ferrules)	ea.	22330	

SUPPLIES & ACCESSORIES



22997

Metric Wrench Set

High-quality 6 x 7 mm, 8 x 10 mm, and 16 x 17 mm wrenches for tightening a wide variety of fittings.

Description	qty.	cat.#	price
Metric Wrench Set	set	22997	



22999

Metric 9 Piece Ball-Point Hex Key Set

Includes 9 metric hex keys (Allen wrenches): 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10 mm.

Description	qty.	cat.#	price
Metric 9 Piece Ball-Point Hex Key Set	set	22999	



22183

Everything you need
in one complete kit!

Make Life Easier (MLE) Capillary Tool Kit

for Thermo Scientific GCs

Includes:

- capillary installation gauge for Thermo Scientific GCs
- liner cap removing tool for Thermo Scientific GCs
- 1/8", 3/16", and 1/4" nylon brushes
- 1/4", 3/8", and 3/16" stainless steel wire tube brushes
- stainless steel surface brush
- 6 stainless steel jet reamers (0.25–0.65 mm OD)
- 1/4" x 3/16" open end wrench
- 3/8" x 7/16" open end wrench
- 6 mm x 7 mm open end wrench
- 8 mm x 10 mm open end wrench
- 16 mm x 17 mm open end wrench
- rubber-tipped slide-lock tweezers
- scoring wafers with handles
- inlet liner removal tool
- septum puller
- mini wool puller/insert tool
- 4-inch tapered needle file
- swivel head flashlight
- mini hand drill set
- 15 cm compact steel ruler
- pocket magnifier
- high temperature string (1 meter)
- pipe cleaner (12-inch)
- cotton tip swabs (pk. of 25)

Description	qty.	cat.#	price
MLE Capillary Tool Kit	kit	22183	

ETP Electron Multipliers for Mass Spectrometry

- Air stable.
- 2-year shelf life guarantee.
- Discrete dynode design results in extended operating life.

The multi-dynode approach of all ETP multipliers results in longer lifetimes and better sensitivities compared with channel multipliers because of greater surface area.

The electron multipliers manufactured by ETP use a proprietary dynode material. This material has a number of properties that make it very suitable for use in an electron multiplier. It has very high secondary electron emission, which allows exceptional gain to be achieved from each dynode. This material is also very stable in air. In fact, an ETP multiplier can be stored for years before being used. As a direct result of the high stability of the active materials used in ETP multipliers, they come with a 2-year shelf life warranty (stored in original sealed package). Many testing laboratories take advantage of this long shelf life by keeping a replacement ETP multiplier on hand, ready for immediate installation. This keeps the instrument



Electron Multiplier for Thermo Scientific
For Thermo TRACE DSQ, DSQII, and DSQIII
Other ETP Electron Multipliers are available. If you do not see your instrument listed

did you know?

A typical ETP electron multiplier has a total active dynode surface area of ~1,000 mm² compared to a standard continuous dynode multiplier that only has a total channel surface area of around 106 mm². The increased surface area of the ETP slows the aging process and improves operating life.



22082

Transfer Line Reducing Kit

for Thermo Scientific TRACE and Focus DSQ Mass Spectrometers

Meets or exceeds original manufacturer's performance.

Description	Similar to TS part #	qty.	cat.#	price
Transfer Line Reducing Kit for Thermo Scientific TRACE and Focus DSQ Mass Spectrometers	76458-2014s, 76458-2009s, A0101-03151	kit	22082	

EZ No-Vent® GC Column-Mass Spectrometer Connector

for Thermo Scientific Focus DSQ GC Mass Spectrometers

- Change GC/MS columns in minutes without venting—100 µm transfer line throttles vacuum and prevents venting.
- Easy to install and maintain—no special tools or plumbing required.
- Gold-plated body for inertness.
- Deactivated transfer line keeps analytes focused; high-temperature polyimide ferrules eliminate leaks at the problematic transfer line fitting.
- Lower cost than other “no-vent” fittings.

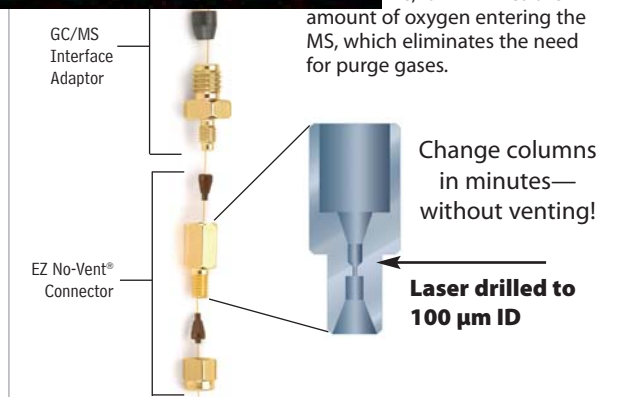


22454

We designed the EZ No-Vent® GC column-mass spectrometer connector to be simple and easy to use. A critical orifice in the EZ No-Vent® connector minimizes the amount of oxygen allowed into the MS source, eliminating the need for purge gas as is required for other manufacturer's vent systems. This enables you to skip the lengthy vent and pump-down cycle otherwise required when you make a column change. This can save nearly a day of down-time with each column change. The EZ No-Vent®

The EZ No-Vent® connector incorporates a laser drilled orifice for optimal flow through the fitting. With the 100 µm ID transfer line, it minimizes the





amount of oxygen entering the MS, which eliminates the need for purge gases.






Change columns in minutes—without venting!


Laser drilled to 100 µm ID

Description	qty.	cat.#	price
EZ No-Vent Connector Kit for Thermo Scientific Focus DSQ GC Mass Spectrometers Includes: EZ No-Vent Connector, interface adaptor, two 0.4mm ID adaptor ferrules for capillary column, two 0.4mm ID ferrules for transfer line, 100µm deactivated transfer line (3 ft.), column plug, column nut	kit	22454	
Replacement ferrules for connecting capillary column to EZ No-Vent Connector:			
0.4mm ID (Polyimide)	2-pk.	21015	
0.5mm ID (Polyimide)	2-pk.	21016	
Replacement ferrules for connecting transfer line to EZ No-Vent Connector: 0.4mm ID	2-pk.	21043	
Replacement 100µm deactivated transfer line	3 ft.	21018	
Replacement EZ No-Vent Column Nut	20-pk.	23100	
Replacement EZ No-Vent Plug	5-pk.	23112	
Open-End Wrenches, 3/8" x 5/16"	2-pk.	20110	
Open-End Wrenches, 3/8" x 7/16"	2-pk.	22455	

Splitless Liners for Varian 1075/1077 S/SL Injection Ports	Benefits/Uses:	ID* OD x Length	Similar to Varian part #	ea.	cat.#/price 5-pk.	25-pk.
 2mm Splitless	trace samples <2µL	2.0mm 6.3mm x 74mm	190010905	20721	20722	20723
 4mm Splitless	trace samples >2µL	4.0mm 6.3mm x 74mm	—	20904	20905	20906
 Double Gooseneck	trace, active samples up to 4µL	4.0mm 6.3mm x 74mm	—	20847	20848	20849
 Cyclo Double Gooseneck	trace, dirty, active samples up to 4µL	4.0mm 6.3mm x 74mm	—	20897	20898	—

Split Liners for Varian 1075/1077 S/SL Injection Ports	Benefits/Uses:	ID* OD x Length	Similar to Varian part #	ea.	cat.#/price 5-pk.	25-pk.
 1mm Split	purge & trap inlet splitting or samples <1µL	1.0mm 6.3mm x 72mm	—	20970	20971	—
 Splitter w/Wool	universal, use with rapid autosamplers	4.0mm 6.3mm x 72mm	190010901	20792	20793	20794
 Laminar Cup Splitter	high MW compounds	4.0mm 6.3mm x 72mm	190010902	20803	20804	—
 Cup Splitter	high & low MW compounds	4.0mm 6.3mm x 72mm	—	20724	20725	—
 Cyclo splitter					20728	—
 Frit Splitter					20716	20717
 Baffle Splitter					20719	20720
 Split Precision Liner w/Wool	dirty samples, active samples	4.0mm 6.3mm x 72mm	—	21030	21031	—

DI Liners for Varian 1075/1077 S/SL Injection Ports (0.32/0.53mm ID)	Benefits/Uses:	ID* OD x Length	Similar to Varian part #	ea.	cat.#/price 5-pk.	25-pk.
 Uniliner	trace, active samples, high recovery & linearity	4.0mm 6.3mm x 72mm	—	20345	20346	—
 Cyclo-Uniliner	trace, dirty, high MW, active samples, linearity	4.0mm 6.3mm x 72mm	—	20347	20348	—
 Open-top Uniliner w/Wool	trace, dirty, active samples, high recovery & linearity	4.0mm 6.3mm x 72mm	—	20845	20846	—

SPME Liners for Varian 1075/1077 S/SL Injection Ports	Benefits/Uses:	ID* OD x Length	Similar to Varian part #	ea.	cat.#/price 5-pk.	25-pk.
 SPME Liner	ideal for low-volume SPME applications	0.75mm 6.3mm x 74mm	—	21112	21113	—

*Nominal ID at syringe needle expulsion point.




SUPPLIES & ACCESSORIES




All liners are
100%
deactivated



All liners are shipped intermediate polarity (IP) deactivated unless otherwise requested.



COLUMN INSTALLS THIS END

SPI Liners for Varian S/SL Injection Ports	Benefits/Uses:	ID* OD x Length	Similar to Varian part #	ea.	cat.#/price 5-pk.	25-pk.
 0.5mm SPI	high linearity for 0.25 & 0.32mm ID columns	0.53mm 4.6mm x 54mm	190010906	20775	20776	20777
 0.8mm SPI	high linearity for 0.53mm ID columns	0.80mm 4.6mm x 54mm	190010907	20778	20779	20780
 SPI with Buffer	dirty samples >1μL, fits 0.25, 0.32 & 0.53mm ID columns	2.4mm 4.6mm x 54mm	190010908	20850	20851	20852

Liners for Varian 1177 S/SL Injection Ports	Benefits/Uses:	ID* OD x Length	Similar to Varian part #	ea.	cat.#/price 5-pk.	25-pk.
 4mm Split w/Glass Frit	universal	4.0mm 6.3mm x 78.5mm	—	21045	21046	—
 4mm Split w/Wool	universal, use with Agilent 7673 autosampler	4.0mm 6.3mm x 78.5mm	392611934	—	21079	—
 4mm Split Precision Liner w/Wool	dirty samples, trace samples	4.0mm 6.3mm x 78.5mm	—	20759	20762	—
 Low Pressure Drop Precision Liner w/Wool	trace samples <2μL, dirty samples	2.0mm 6.3mm x 78.5mm	—	22421	22422	—
 Laminar Cup Splitter		4.0mm		20765	20768	—
 2mm Splitless w/Wool					21077	—
 Gooseneck Splitless (4mm)					21897	—
 Gooseneck Splitless (4mm) w/Wool		6.3mm x 78.5mm			21897-200.5	—
 Double Gooseneck Splitless (4mm)	trace, active samples <2μL	4.0mm 6.5mm x 78.5mm	392611929	21891	21892	—

DI Liners for Varian 1177 S/SL Injection Ports (For 0.25/0.32/0.53mm ID Columns)	Benefits/Uses	ID* OD x Length	Similar to Varian part #	cat.#/price ea.	cat.#/price 5-pk.
 Drilled Uniliner (hole near top)	trace, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm	—	21470	21471
 Drilled Uniliner (hole near bottom)	trace, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm	—	21468	21469







*Nominal ID at syringe needle expulsion point.



All liners are
100% deactivated

All liners are shipped intermediate polarity (IP) deactivated unless otherwise requested.

SUPPLIES & ACCESSORIES

COLUMN INSTALLS THIS END

Liners for Varian 1078/1079 Injection Ports	Benefits/Uses:	ID* OD x Length	Similar to Varian part #	ea.	cat.#/price 5-pk.	25-pk.
 1078/1079 Split w/CarboFrit	dirty samples, non-active compounds	3.4mm 5.0mm x 54mm	392611946	21708	21709	—
 1078/1079 Splitless	trace samples <2µL	2.0mm 5.0mm x 54mm	392611947	21711	21712	—
 Open 0.5mm ID	trace samples <1µL	0.5mm 5.0mm x 54mm	392611949	20992	20993	—
 1078/1079 Split-No Frit	active samples	3.4mm 5.0mm x 54mm	392611945	20859	20901	20909
 Open 0.75mm ID	trace, low volume samples	0.75mm 5.0mm x 54mm	392611948	21714	21715	21716
 1078/1079 Split Precision Liner w/Wool	dirty samples, trace samples	3.4mm 5.0mm x 54mm	—	21024	21025	—

DI Liners for Varian 1078/1079 Injection Ports (For 0.25/0.32/0.53mm ID Columns)	Benefits/Uses	ID* OD x Length	Similar to Varian part #	cat.#/price ea.	cat.#/price 5-pk.
 Drilled Uniliner (hole near top)	trace, active samples, high recovery & linearity	3.5mm 5.0mm x 54mm	—	24974	24975
 Drilled Uniliner (hole near bottom)					22281

*Nominal ID at syringe needle exit



Drilled Uniliner® Liners

Use the Drilled Uniliner® liner with the hole near the bottom for semivolatiles analysis or when compounds of interest could be affected by a tailing solvent peak. Use the Drilled Uniliner® liner with the hole near the top for chlorinated pesticides analysis, aqueous injections, as well as for analysis in which the compounds of interest elute away from the solvent peak.

Siltek® Treated Metal Inlet Liners for Varian GCs

- Won't crack, chip, or break like glass liners.
- Excellent response for pesticides, phenols, and other active compounds.

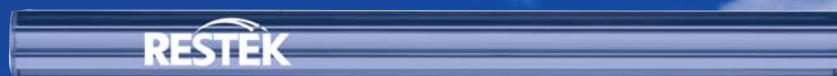
Liner Type (3.8mm ID x 5.0mm OD x 54mm)	qty.	cat.#	price
Split/Splitless	5-pk.	20711	
Splitless Gooseneck	5-pk.	21002	



SUPPLIES & ACCESSORIES

Sky
Inlet Liners

Introducing **Sky™** Liners



See page 206 for more details.

RESTEK

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11/12

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Inlet Liner Seals

for Varian 1177 Injectors

Meets or exceeds original manufacturer's performance.

Description	Max. temp.	Similar to Varian part #	10-pk. cat.# price	50-pk. cat.# price
6.35mm ID Graphite				
O-Rings for split liners	450°C	—	20296	20297
6.5mm ID Graphite				
O-Rings for splitless liners	450°C	39-26119-40	20298	20299

Liner Seals

for Varian 1078/1079 GCs

Description	Max. temp.	Similar to Varian part #	qty.	cat.#	price
5mm Graphite Liner Seals for Varian 1078/1079 GCs	450°C	392611919, 392534201	10-pk.	22683	

IceBlue®



BTO®

Septa

for Varian GCs

- Precision molding assures consistent, accurate fit.
- Preconditioned and ready to use.
- Does not adhere to hot metal surfaces.
- Packaged in precleaned glass jars.

Septum Diameter	25-pk./price	50-pk./price	100-pk./price
Thermolite Septa (usable to 340°C inlet temp.)			
9mm	27132	27133	27134
9.5mm (3/16")	27135	27136	27137
10mm	27138	27139	27140
11mm (7/16")	27141	27142	27143

IceBlue Septa (usable to 250°C inlet temp.)

9mm	—	—	27156	27157
9.5mm (3/16")	—	—	27158	27159
10mm	—	—	27160	27161
11mm (7/16")	—	—	27162	27163

BTO Septa (usable to 400°C inlet temp.)

9mm CenterGuide	—	—	27104	27105
9.5mm (3/16")	—	—	27106	27107
10mm	—	—	27108	27109
11mm (7/16") CenterGuide	—	—	27110	27111

HANDY
septum size chart

Injector Type	Septum Diameter (mm)
Packed Column	9.5/10
1078/1079	10/11
1177	9
1075/1077	11

Merlin Microseal Septa

for Varian GCs

350 °C max injection port temperature.

NEW!

The Merlin Microseal Septum includes elimination of septum crumpling and consistent low needle penetration. The septum incorporates two separate seals to eliminate septum coring and septum crumbs in the injection port.

The Merlin Microseal Septum uses a 25 gauge (0.63 mm, 0.025") needle or probe with a blunt, truncated conical tip. Since the syringe plunger end details are determined by manual or autosampler compatibility, often a removable needle syringe is an effective way to match both of these requirements. Installation is simple, requiring no modification of the injection port.

Description	Merlin#	cat.#	price
Varian 1078/1079 Kit (septum cap adapter, O-ring, nut, septum)	21-11w	22779	
Varian 1177 Kit (septum cap adapter, O-ring, nut, spacer ring, septum)	22-11w	22780	
Replacement Septum for Varian Kits (1 septum)	21-01w	22782	

also available

Looking for ferrules?
See pages 284-286.





Capillary Nuts for Varian GCs

Choose brass or stainless steel construction.

Description	Similar to Varian part #	qty.	cat.#	price
Brass Capillary Nuts	03-949551-00	2-pk.	20881	
Stainless Steel Capillary Nuts	03-949551-00	2-pk.	20882	



Siltek® Treated Inlet Support Springs for Varian 1075/1077 Split Injectors

Siltek® treated to eliminate sample adsorption.

Description	Varian part #
Siltek Treated Inlet Support Springs for Varian 1075/1077 Split Injectors	03-949551-00



Capillary Installation Gauge

for Varian GCs for use with 1/16" ferrules

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

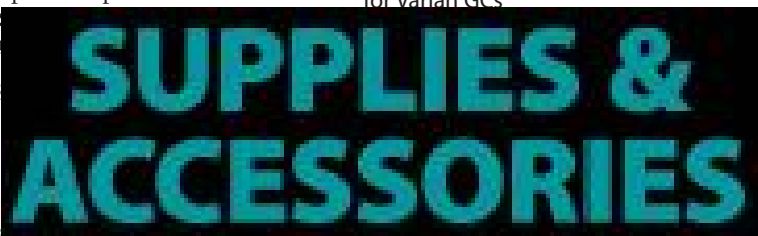
Description	qty.	cat.#	price
Capillary Installation Gauge for Varian GCs for use with 1/16" ferrules	ea.	22335	

*Recommended for use with graphite ferrules.

Everything you need
in one complete kit!



Make Life Easier (MLE) Capillary Tool Kit for Varian GCs



22335

- 0.25–0.65 mm OD)
- 1/4" x 5/16" open end wrench
- 3/8" x 7/16" open end wrench
- 7/16" x 1/2" open end wrench
- 1/2" x 9/16" open end wrench
- rubber-tipped slide-lock tweezers
- 15 cm compact steel ruler
- pocket magnifier
- high temperature string (1 meter)
- pipe cleaner (12-inch)
- cotton tip swabs (pk. of 25)

Description	qty.	cat.#	price
MLE Capillary Tool Kit	kit	22184	

Rethreading Tool

- Repair worn or damaged threads.
- Multiple uses (injection ports, fittings, etc.).
- Built-in guide to prevent cross-threading.



Make your injection port threads like new!

Simply screw the rethreading tool onto the part, unscrew, and inspect the threads. Repeat as necessary. When done, wipe threads clean with methanol to remove any debris.

Description	qty.	cat.#	price
Rethreading Tool for 7/16" compression fitting (Varian injection ports)	ea.	23019	
Rethreading Tool for 1/4" Varian-style capillary column fittings	ea.	21893	

Sky

Introducing Sky™ Liners

Inlet Liners

See page 206 for more details.

restek
innovation!

Kit installs easily,
without special tools
or plumbing.



EZ No-Vent® GC Column-Mass Spectrometer Connector for Varian Saturn 2000 Series Mass Spectrometers

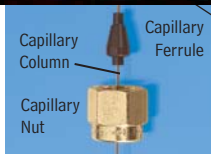
- Change GC/MS columns in minutes without venting—100 μ m transfer line throttles vacuum and prevents venting.
- Easy to install and maintain—no special tools or plumbing required.
- Gold-plated body for inertness.
- Deactivated transfer line keeps analytes focused; high-temperature polyimide ferrules eliminate leaks at the problematic transfer line fitting.
- Lower cost than other “no-vent” fittings.

We designed the EZ No-Vent® GC column-mass spectrometer connector to be simple and easy to use. A critical orifice in the EZ No-Vent® connector minimizes the amount of oxygen allowed into the MS source, eliminating the need for purge gas as is required for other manufacturer's vent systems. This enables you to skip the lengthy vent and pump-down cycle otherwise required when you make a column change. This can save nearly a day of down-time with each column change. The EZ No-Vent® connector easily attaches to the MS source without special tools or extra plumbing.



Figure 1 The EZ No-Vent® connector incorporates a laser machined orifice for optimal flow through the fitting. Coupled with the 100 μ m ID transfer line, it minimizes the amount of oxygen entering the MS, which eliminates the need for purge gases.

SUPPLIES & ACCESSORIES



Laser drilled
to 100 μ m ID

Change columns in minutes—
without venting!

Description	qty.	cat.#	price
EZ No-Vent Connector Kit for Varian Saturn 2000 Series MSs			
Includes: EZ No-Vent Connector, two 0.4mm ID adaptor ferrules for capillary column, two 0.4mm ID ferrules for transfer line, 100 μ m deactivated transfer line (3 ft.), column plug, column nut			
Replacement ferrules for connecting capillary column to EZ No-Vent Connector:			
0.4mm ID (Polyimide)	2-pk.	21015	
0.5mm ID (Polyimide)	2-pk.	21016	
Replacement ferrules for connecting transfer line to EZ No-Vent Connector:			
0.4mm ID	2-pk.	21043	
Replacement 100 μ m deactivated transfer line	3 ft.	21018	
Replacement EZ No-Vent Column Nut	20-pk.	23100	
Replacement EZ No-Vent Plug	5-pk.	23112	
Open-End Wrenches, 1/4" x 5/16"	2-pk.	20110	

Converting Packed Inlets to Capillary Column Use

Two types of inlet conversion kits are available for a 1/4-inch packed column injection port to fit either 0.32 or 0.53 mm ID capillary columns: the Vu-Tight liner and the Uniliner® liner with adaptor (next page). The Vu-Tight liner fits directly into the 1/4-inch injection port and allows visual confirmation of the connection between the column and the liner. The Uniliner® liner and adaptor work together to allow either direct or on-column injection when using 0.53 mm ID columns. Both systems incorporate a Press-Tight® connection between the liner and column inlet, minimize dead volume, and reduce solvent peak tailing.

Features of Both Conversion Kits:

- Fit Agilent, Varian, and other common GCs with 1/4-inch packed column injection ports (with maximum insertion depth of 4 inches).
- Install easily within fifteen minutes.
- Accommodate either 0.32 or 0.53 mm ID fused silica columns (tubing OD ≥ 0.5 mm).
- Liners are deactivated and extremely inert.
- Liners designed to accept dirty samples are available for either system.
- Press-Tight® connections between the liner and column inlet minimize dead volume, reduce solvent peak tailing, and sharpen early-eluting components.

Vu-Tight Inlet Liners

for 1/4-Inch Packed Injection Port

- Visually observe the Press-Tight® column end and liner.
- Fit 0.32 and 0.53 mm ID capillary columns (column ODs from 0.5 mm to 0.8 mm).
- Slotted top prevents obstruction of carrier gas flow.
- Two designs available.
- Operate in the direct injection mode.

Vu-Tight Inlet Liners

for 1/4-Inch Packed Injection Port Conversion

Can easily be packed with wool for dirty samples.

Description	qty.	cat.#	price
Vu-Tight DI Liner	ea.	20342	
Vu-Tight DI Liner	5-pk.	20343	
Vu-Tight DI Liner	25-pk.	20344	

Cyclo Vu-Tight DI Liner (1/4-inch OD)

Ideal for dirty samples. Spiral bore prevents nonvolatile residue from contaminating the column.

Description	qty.	cat.#	price
Cyclo Vu-Tight DI Liner	ea.	20787	
Cyclo Vu-Tight DI Liner	5-pk.	20788	

Vu-Tight Installation Fittings Kit

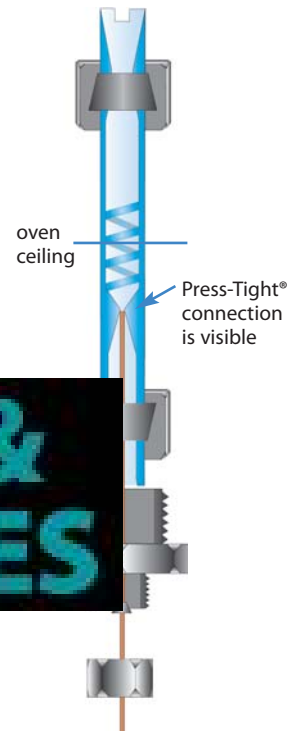
Includes a 1/4-inch stainless steel nut and graphite ferrule for attaching the liner to the GC inlet and a 1/4 to 1/16-inch stainless steel reducer, plus a 1/4-inch and 0.5 mm ID graphite ferrule for attaching the column to the liner.

Description	qty.	cat.#	price
Vu-Tight Installation Fittings Kit	kit	20504	

it's a fact

Vu-Tight Inlet Liners

The 1/4-inch Vu-Tight liner fits directly into a 1/4-inch injection port. The connection between the liner and the column is in the GC oven, allowing visual confirmation of the seal. Problems, such as a crushed column end in the Press-Tight® taper, can be detected easily, making proper installation worry-free. The Cyclo Vu-Tight liner prevents nonvolatile residue from contaminating the column.

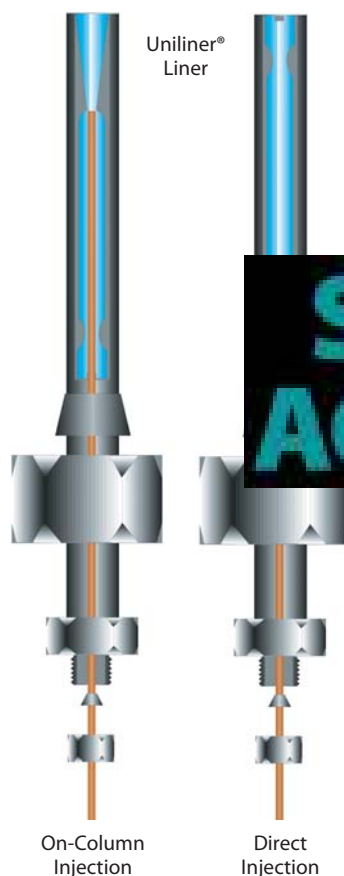


SUPPLIES & ACCESSORIES



it's a fact

5 mm Uniliner® liners fit into the 1/4-inch Uniliner® Liner Adaptor, which fits into a 1/4-inch injection port. The Uniliner® liner can be inserted in one direction for direct injections or inverted for on-column injections. Because the 1/4-inch injection port ferrule seals against the metal liner adaptor surface, it is virtually impossible to crack the glass Uniliner® liner during installation.



Uniliner® Liner

for 1/4-Inch Packed Injection Port Conversion

- Reduces solvent tailing.
- Versatile—0.53 mm ID version can be used in the direct (DI) or on-column (OC) injection mode.
- Incorporates a gentle taper that seals the column and reduces dead volume in direct injection mode.
- Available in various designs.

On-column injections can be performed only with 0.53 mm ID columns because 26-gauge needles do not fit into the bore of 0.32 mm ID columns, or into the Uniliner® liner taper.

Description	Column ID Injection Mode*	ea. cat.#/price	5-pk. cat.#/price
Uniliner Liner (small buffer volume chamber 60mm long, for injections $\leq 2\mu\text{L}$)	0.53mm DI or OC	20902	20903
Uniliner Liner (large buffer volume chamber 85mm long, for injections $\leq 4\mu\text{L}$)	0.32 & 0.53mm DI only	20308	20309
	0.53mm	20301	20305
Open Top Uniliner Liner (packed with wool)		20319	20320
	0.32 & 0.53mm DI only	20315	20316
Low Volume/Purge & Trap Uniliner Liner (1mm ID x 5mm OD: use in 1/4" injection ports to troubleshoot purge & trap units)	0.32 & 0.53mm DI only	20307	20314

SUPPLIES & ACCESSORIES

Uniliner Liner Adaptor

(required for installing Uniliner liners in 1/4" injection ports)



Includes 1/4-inch nut & graphite ferrule, 1/16-inch nut, and 0.8mm ID graphite ferrule.

	Stainless Steel	Siltek-Treated
For injection ports <8cm	20310	22282
For injection ports 8-15cm	20311	
	cat.# 20234 (5-pk.)	

1/4" Ferrules for Uniliner Liner Adaptor

*DI = direct injection, OC = on-column injection

Note: a Uniliner liner must be used with a Uniliner Liner Adaptor (cat.# 20310 or 20311) for 1/4-inch injection ports. Remember to include a liner adaptor when ordering a Uniliner liner, unless you are purchasing replacement Uniliner liners.



also available

Looking for other packed column accessories for Agilent GCs?
See page 232.

Injection Port Conversion Chart

Instrument	Uniliner Liner Set-Up		Vu-Tight Fitting	
	Uniliner Liner: cat.# 20301, 20305, 20308, 20309, 20315, 20316, 20319, 20320, 20902, & 20903	Liner Adaptor: cat.# 20310	Vu-Tight Fitting Kit: cat.# 20504 Liner: cat.# 20342, 20343, 20344, 20787, & 20788	Vu-Tight Fitting Kit: cat.# 20504
Agilent GCs (1/4-inch injection ports) Models: 5700, 5710, 5711, 5712, 5830, 5840, 5880, 5890, 6850, 6890	✓	✓	✓	✓
Varian GCs (1/4-inch injection ports) Models: 1200, 1400, 2100, 2400, 3300-3700, 4400, 4600, 6000	✓	✓	✓	✓
Tracor GCs (1/4-inch injection ports) Models: 540, 550, 560, 565, 570	✓	✓	✓	✓
Packard Becker GCs (1/4-inch injection ports) Models: 427, 428, 429, 430, 433, 436, 437, 438	✓	✓	✓	✓
Gow-Mac GCs (1/4-inch injection ports) Models: 69-750, 69-550	✓	✓	✓	✓
HNU GCs (1/4-inch injection ports) Models: 301, 401, 421	✓	✓	✓	✓
PerkinElmer GCs (1/4-inch injection ports) Models: Sigma, 1B-4B, 300, 2001, 2100	✓	✓	✓	✓
PerkinElmer Auto SYS*	✓			

*Does not require Uniliner liner adaptor.

**SUPPLIES &
ACCESSORIES**

Sky
Inlet Liners

Introducing **Sky™ Liners**

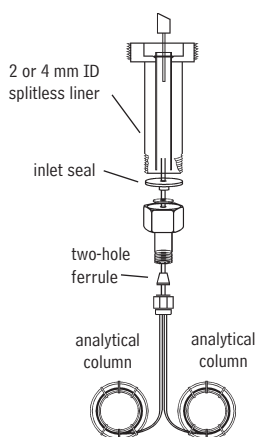


See page 206 for more details.

Dual Column Analysis: Which technique is right for you?

Split/Splitless Injection

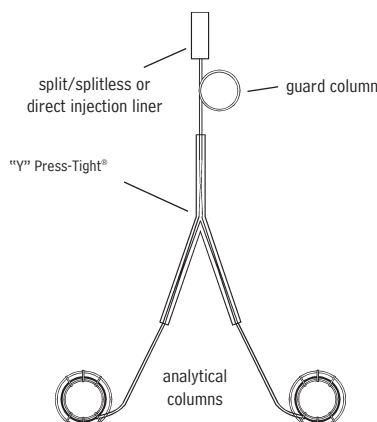
Two-hole ferrules allow dual-column confirmational analysis in the same split/splitless inlet.



0.25 and 0.32 mm ID columns can be used with standard $\frac{1}{16}$ -inch inlet fittings (cat. # 27185). 0.53 mm ID columns require $\frac{1}{8}$ -inch inlet fittings (cat. # 20645) to allow both columns to be inserted side by side in the injector. Use either standard or extended gooseneck split/splitless inlet.

Split/Splitless or Direct Injection

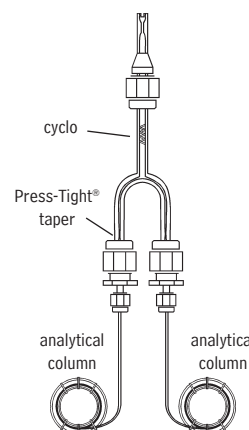
The "Y" Press-Tight® configuration allows dual columns to be used in either a split/splitless or direct injection inlet.



The "Y" Press-Tight® configuration offers versatility because it allows any diameter

Direct Injection

The direct injection "T" allows two 0.32 or 0.53 mm ID columns to be connected to one $\frac{1}{4}$ -inch packed column inlet.



The direct injection "T" incorporates a glass spiral to ensure complete vaporization prior to splitting into two columns. The dual sealing design provides ease of use and confidence relative to the "Y" Press-Tight®

SUPPLIES & ACCESSORIES

Analyzing the same sample on two columns simultaneously, without having to repeat the analysis, is a more efficient way to improve analytical reliability without reducing sample throughput. This involves connecting two capillary columns to one GC inlet and connecting each column to its own detection system. Both columns are usually of the same internal diameter so the flow rates are balanced and similar amounts of the analytes are directed onto each column. This approach will result in confirmational analysis without reducing sample throughput. Simultaneous dual-column analysis has become a more routine technique used by laboratories involved with complex analyses in complicated matrices.

Split or Splitless Injectors

Split or splitless injections are the easiest dual-column analyses to perform. Both columns can be inserted into the split/splitless inlet fitting and terminate in the inlet liner. Columns with internal diameters of 0.32 mm or less (or 0.5 mm OD) can be inserted directly into the $\frac{1}{16}$ -inch standard capillary fitting (cat.# 27185, page 269) by using a two-hole capillary ferrule. Columns with internal diameters of 0.53 mm cannot be inserted into a standard $\frac{1}{16}$ -inch capillary fitting because the outside column diameter (0.8 mm) is too large for both to fit simultaneously. Special fittings that use a $\frac{1}{8}$ -inch fitting and $\frac{1}{8}$ -inch, two-hole ferrule can be used for 0.53 mm ID column (cat.# 20645, page 269).*

On-Column or Direct Injections

On-column or direct injections require a Press-Tight® connection to the inlet liner. Usually a section of 0.53 mm ID guard tubing is attached to one leg of a Press-Tight® "Y" connector (cat.# 20405, page 270). Analysts must use columns of equivalent length and ID so that the flow through both legs of the "Y" is similar, or the detector response will differ. Another approach is to use a Dual Column Direct Injection Tee (cat.# 20412, page 269) or *mini-Lam* Direct Injection Tee (cat.# 20436, page 269), that is installed into the injector, with each column connected to the remaining legs of the tee. The Dual Column Direct Injection Tee has a vaporization chamber to reduce sample backflash and a glass spiral to ensure sufficient vaporization and to reduce discrimination or preferential splitting. The *mini-Lam* Direct Injection Tee is similar—it incorporates an inverted cup in place of the glass spiral. More information on these types of injection tees is given on the facing page.

*Instrument-specific fittings for performing dual column analyses can be found in the **Supplies for Agilent** and **Supplies for Varian** sections.

Packed Column Inlet Fittings

(Direct Injection into 0.32 or 0.53 mm ID Capillary Columns)

Dual Column Direct Injection Tee
(for 1/4-inch packed column inlets)

- Designed with a glass spiral to promote sample vaporization and provide even sample distribution to the two columns.
- Traps sample residue and minimizes the need for guard columns.
- Press-Tight® taper in each outlet leg facilitates a perfect dead-volume-free connection to each analytical column (OD 0.4 to 0.8 mm) and allows visual confirmation of the column connection.



20412

Description	qty.	cat.#	price
DI Tee Kit (includes all fittings/ferrules)	kit	20412	
Replacement Tee	ea.	20411	

Inlet Adaptor Kit for Dual Column Installation for Agilent Capillary Injectors

(Split/splitless fitting for capillary columns)

- 1/16-inch split/splitless fitting that accepts standard, two-hole capillary ferrules.
- Easier to install capillary columns due to the nut protruding farther from the insulated injection port chamber.
- Same column insertion depth as the original manufacturer's equipment.
- Kit includes adaptor fitting, 1/16" capillary nut, gold-plated 1.2 mm ID Dual Vespel® Ring Inlet Seal, one 0.4 mm ID two-hole ferrule, and one 0.5 mm ID two-hole ferrule.



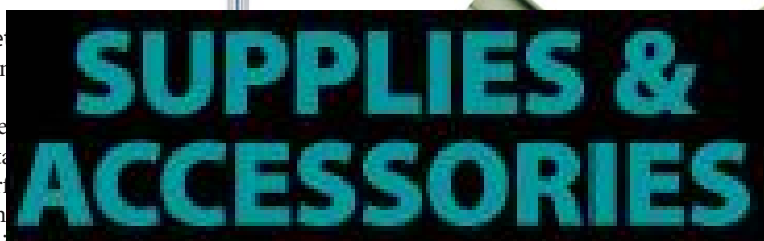
27185

Description	qty.	cat.#	price
Inlet Adaptor Kit for Dual Column Installation for Agilent Capillary Injectors	kit	27185	
	2-pk.	21246	
1.2mm ID Dual Vespel Ring Inlet Seal, Gold-Plated	10-pk.	21247	

Dual Column mini-Lam Direct Injection Tee

(for 1/4-inch packed column inlets)

- Inverted cup design offers controlled sample vaporization.
- Permits larger sample volume.
- Incorporates a Press-Tight® taper in each outlet leg, to make a perfect dead-volume-free connection to each analytical column (ODs ranging from 0.4 to 0.8 mm).
- Allows visual confirmation of the column connection.
- Open-top design makes it easy to pack with glass wool, keeping sample residue from contaminating the cup.



20436

Description	qty.	cat.#	price
mini-Lam DI Tee Kit (includes all fittings and ferrules)	kit	20436	
Replacement 4mm mini-Lam DI Tee	ea.	20435	

1/8-Inch Capillary Inlet Adaptor Fitting Kit

(split/splitless fitting for 1/8-inch ID capillary columns)

- 1/8-inch split/splitless fitting accepts standard two-hole capillary ferrules and a standard 1/8-inch nut.
- Makes column installation easy due to the nut protruding farther from the insulated injection port chamber.
- The column insertion depth is the same as the original equipment.
- Kit includes adaptor fitting, capillary nut, stainless steel inlet seal, washer, and one 0.8 mm ID two-hole ferrule.
- Use recessed gooseneck liners with this adaptor.

Description	qty.	cat.#	price
1/8-Inch Capillary Inlet Adaptor Fitting Kit	kit	20645	
0.53mm ID Dual-Column Installation	2-pk.	20392	
1/16-inch ID (Opening) Replacement Inlet Seal	10-pk.	20393	

Graphite Replacement Ferrules

ID	ferrule size	qty.	cat.#	price
0.5mm	1/16"	10-pk.	20201	
	1/16"	50-pk.	20228	
0.8mm	1/16"	10-pk.	20202	
	1/16"	50-pk.	20224	
1/4-inch	1/4"	10-pk.	20210	

**Two-Hole Ferrules**

for 1/8-Inch and 1/16-Inch Compression-Type Fittings

- Use 1/16-inch, two-hole ferrules with the 1/16-Inch Capillary Inlet Adaptor Fitting Kit (cat.# 27185)
- Use 1/8-inch, two-hole ferrules with the 1/8-Inch Capillary Inlet Adaptor Fitting Kit (cat.# 20645).



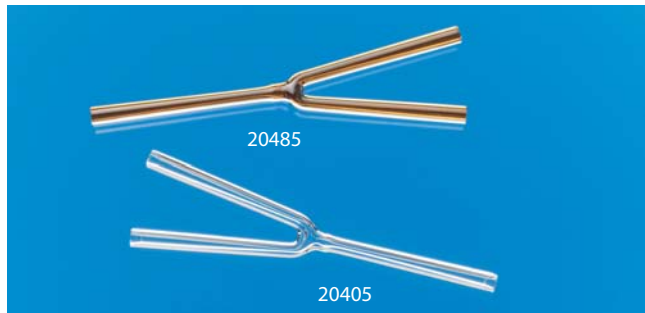
Fitting Size	Ferrule ID	Fits Column ID	qty.	Vespel/Graphite
1/16"	0.4mm	0.25/0.28mm	5-pk.	24848
1/16"	0.5mm	0.32mm	5-pk.	24849
1/8"	0.8mm	0.45/0.53mm	5-pk.	20246

also available

Please see our detailed GC column ferrule product listing on pages 284–286.

Press-Tight® Connectors

- Deactivated Press-Tight® connectors assure better recovery of polar and nonpolar compounds.
- Siltek® treated connectors are ideal for organochlorine pesticides analysis.
- Fit column ODs from 0.33–0.74 mm (Restek 0.1 mm–0.53 mm ID).



Universal “Y” Press-Tight® Connectors

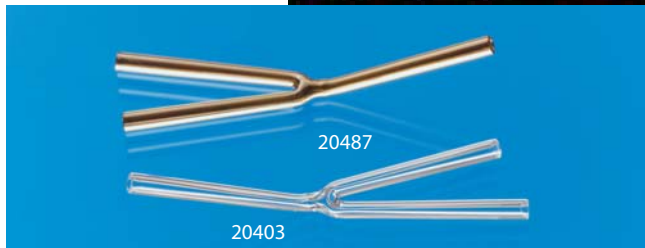
An alternative method of performing dual-column confirmational analyses!

- Split sample flow onto two columns.
- Split a single column flow into two columns for confirmation analysis with a single injection.

Description

Universal “Y” Press-Tight Connector
Universal “Y” Press-Tight Connector, Deactivated
Universal “Y” Press-Tight Connector, Siltek Treated

SUPPLIES & ACCESSORIES



Universal Angled “Y” Press-Tight® Connectors

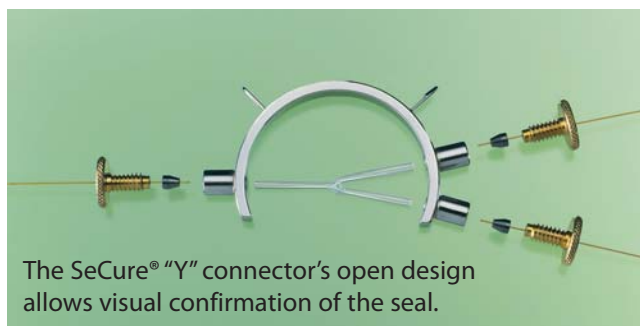
- Perform confirmation analysis with a single injection.
- Made from inert fused silica.
- Inlet and outlet ends conform to the column curvature—alleviates column-end connection strain.

Description	ea./price	3-pk./price
Universal Angled “Y” Press-Tight Connector	20403 \$77	20404
Universal Angled “Y” Press-Tight Connector, Deactivated	20403-261 \$78	20404-261
Universal Angled “Y” Press-Tight Connector, Siltek Treated	20487 \$87.50	20469

Polyimide Resin

Securely connects a Press-Tight® connector to a fused silica column.

Description	Max. Temp.	qty.	cat.#	price
Polyimide Resin	350°C	5 grams	20445	



The SeCure® “Y” connector’s open design allows visual confirmation of the seal.

SeCure® “Y” Connector Kits

- Connect two analytical columns to a transfer line or guard column.
- Use standard “Y” Press-Tight® connectors and 1/16" graphite ferrules.
- Reliable seal integrity, will not unexpectedly disconnect during temperature-programmed analyses.
- Open design allows visual confirmation of the seal for added confidence in the connection.

Combine the simplicity of a “Y” Press-Tight® connector with the strength of a metal union. The ferrules and knurled nuts hold the fused silica tubing in place, which prevents the tubing from unex-

ID	qty.	cat.#	price
SeCure “Y” Connector Kit	0.45/0.53mm	kit 20276	
Knurled nut		kit 20277	
		3-pk. 20278	
		3-pk. 20279	

MXT® “Y”-Union Connector Kits for Fused Silica Columns

- Low-dead-volume, leak-tight connection.
- Reusable.
- Siltek® treatment ensures maximum inertness.
- Ideal for connecting a guard column or transfer line to an analytical column.
- Use to oven temperatures of 360 °C.
- Available in union and “Y” configurations.
- Can also be used for fused silica to metal connections.



Each kit contains the MXT® union, three 1/32-inch nuts and three one-piece fused silica adaptors.

Description	qty.	cat.#	price
For 0.25mm ID Fused Silica Columns	kit	21389	
For 0.32mm ID Fused Silica Columns	kit	21388	
For 0.53mm ID Fused Silica Columns	kit	21387	

also **available**

See the complete connector product listing on **pages 287–293.**

Replacement Accessories for Hall 1000



ELCD Nickel Reaction Tubes

for Hall 1000

- Pretreated for maximum sensitivity.
- Quality-controlled for reliability.
- Available for many popular models.

To replace these instrument part numbers:		Order these Restek part numbers:		
ELCD Model #	Instrument #	qty.	cat. #	price
	PerkinElmer # N660-1072			
	Shimadzu # 220-90435-00			
	Tremetrics # 117459-0003			
Hall 1000	Varian # 00-997625-12	2-pk.	21581	
O.I. 4420	O.I. Analytical # 260323	2-pk.	21582	

ELCD Nickel Reaction Tube Nut

High-quality stainless steel ELCD mounts nickel reaction tube into instrument.

Description

ELCD Nickel Reaction Tube Nut

1/16-Inch Vespel®/Graphite Sealing Ring

Installs onto the nickel reaction tube after the screw. Easily compresses on the reaction tube to provide a leak-tight seal and prevent detector oxidation.

Description

1/16-Inch Sealing Ring, Vespel/Graphite

qty.

cat. #

price

2-pk.

21583

Cleaned Teflon® Transfer Lines for ELCDs

We stringently clean our ELCD Teflon® transfer lines with an HCl solution to remove any contaminants, then rinse with methanol. Convenient 6.5-inch pre-cut pieces directly interface the nickel reaction tube and conductivity cell in Tracor, Tremetrics, O.I., and many other ELCDs.

Description

Teflon Transfer Lines for ELCDs, 1/16" OD x 0.020" ID (five 6.5-inch lines)

qty.

cat. #

price

5-pk.

20121

Antifoam Agent for Purge & Trap Samples

- Efficiently controls foam; effective over a wide pH range.
- No hazardous materials, no components that are target analytes.
- Effective at less than 0.1% of sample volume.

See page 452.



Purge-and-Trap Spargers

for Tekmar 2000, 3000, or 3100

- Available with uniform frits, to ensure maximum purging efficiency.
- Use nonfritted spargers for wastewater samples.
- Manufactured to tight tolerances to ensure a leak-tight seal.



Description

Volume

qty.

cat. #

price

Fritted Spargers

Fritted, 1/2-inch mount

5mL

ea.

21150

Fritted, 1/2-inch mount

10mL

ea.

26138

Fritted, 1/2-inch mount

25mL

ea.

21151

Non-Fritted Spargers

Non-Fritted, 1/2-inch mount

5mL

ea.

26139

Non-Fritted, 1/2-inch mount

10mL

ea.

26140

Non-Fritted, 1/2-inch mount

25mL

ea.

26141

Moisture Control By-Pass Lines for Tekmar Instruments



and acetates.

based inertness.

2, and OLM4.1.

qty.

cat. #

price

ea.

21035

ea.

21109



20676



20675



23020

Photoionization Lamps

Model 108-10.0/10.6 offers both 10.0 and 10.6 eV potential, has a 0.781" base diameter, and is used in Tracor, OI, and Baseline instruments. Model 103 has a 1.375" base and is used in HNU and SRI detectors. Model 108-BTEX lamp's higher output makes it ideal for detection of BTEX compounds.

Features

Benefits

Longer life.

More for your money with each lamp.

Model 108-BTEX has 33% more output than older models.

Operate continuously at 1 ma and 250°C for 6 months and still have better than 50% of the initial output.

Lamps individually tested.

Your lamp will work to specifications.

Variety of models.

Among the best lamps available for most instrumentation.

Description

eV Rating

Base

qty.

cat. #

price

PID Lamp, Model 103 C

10.2

1.375"

ea.

20676

PID Lamp, Model 108

10.0/10.6

0.781"

ea.

20675

PID Lamp, Model 108-BTEX

10.0/10.6

0.781"

ea.

23020

PID Lamp Polishing Kit (contains iron oxide cleaning compound, swabs, and instructions)

kit

20674

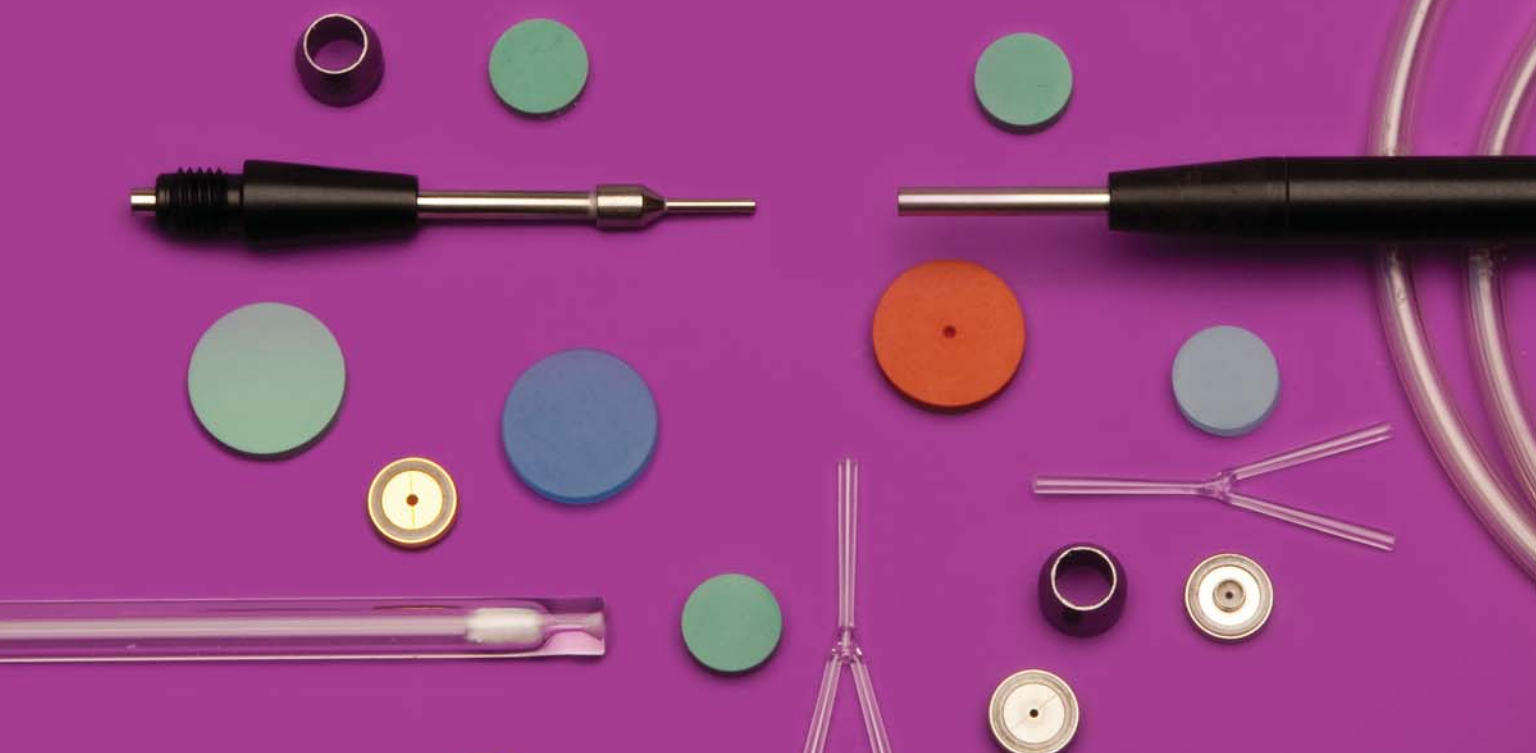
GC ACCESSORIES

COLUMN INSTALLATION

Leak Detector & Flowmeters	273-275
Column Installation Tools & Tool Kits	275-283
Ferrules	284-286
Connectors	287-293

What's
NEW?
look for this
circle

**SUPPLIES &
ACCESSORIES**



RESTEK

HRMalytic
ECHnology Pty Ltd

+61(0)3 9762 2034

Australian Distributors
Importers & Manufacturers
www.chromtech.net.au

11/12

Restek Electronic Leak Detector

Don't let a small leak turn into a costly repair—protect your instrument and analytical column by using a Restek Leak Detector.

Features & Benefits include:

- Optimized sample flow path.
- New ergonomic, hand-held design.
- Rugged side grips for added durability.
- Handy probe storage for cleanliness and convenience.
- Longer lasting battery, up to 6 hours of continuous use.
- Automatic shut-off.
- A convenient carrying and storage case.
- Easy to clean probe assembly.
- A universal charger set (US, European, UK, and Australian plugs included).

Backed by a 1-year warranty, the new Restek Leak Detector sets an industry standard for performance and affordability in hand-held leak detectors.

Leak Detector Facts

Detectable gases:	helium, nitrogen, argon, carbon dioxide, hydrogen
Battery:	Rechargeable Ni-MH internal battery pack (6 hours normal operation)
Operating Temperature Range:	32°-120°F (0°-48°C)
Humidity Range:	0-97%
Warranty:	one year
Certifications:	CE, Ex, Japan
Compliance:	WEEE, RoHS

Limits of Detection

These gases can be detected with the

Gas	Minimum Rate	
Helium		
Hydrogen*		
Nitrogen		
Argon	1.0×10^{-4}	Yellow
Carbon Dioxide	1.0×10^{-4}	Yellow

SUPPLIES & ACCESSORIES



22839



Carrying case included with purchase of unit.

Description	qty.	cat.#	price
Leak Detector with Hard-Sided Carrying Case and Universal Charger Set (US, UK, European, Australian)	ea.	22839	
Leak Detector Routine Maintenance Review**	ea.	22839-R	
Soft-Side Storage Case	ea.	22657	
Small Probe Adaptor	ea.	22658	

*Caution: The Restek Electronic Leak Detector is designed 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. The Restek Electronic Leak Detector may be used for determining trace amounts of hydrogen in a GC environment only.

**Routine maintenance includes inspection of the probe tip, internal/external tubing and a battery replacement.



22657

Optional soft-side storage case is ideal for storing your leak detector in smaller spaces, such as your tool box.



Checking for leaks maintains the integrity of a GC system.

i tech tip

To keep your Leak Detector performing at optimal levels, send it in every two years for a Routine Maintenance Review. Our engineers will inspect the probe tip, internal/external tubing and replace the battery. This preventive maintenance plan will help ensure your leak detector operates properly for years to come.

for more info

How much sensitivity is needed in a leak detector?
www.restek.com/cat001

Verify hard-to-reach leaks using the small probe adaptor.



22658

i tech tip

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

RESTEK

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ECHnology Pty Ltd

Australian Distributors
Importers & Manufacturers
www.chromtech.net.au

11/12

www.restek.com **273**

Lab Gas Issues?

RESTEK HAS THE SOLUTION!

NEW!



restek **innovation!**

Flowmeter Facts:

Type of flowmeter:	volumetric
Battery:	2AA
Operating Temp. Range:	32-120°F (0-48°C)
Warranty:	one year
Certifications:	CE, Ex
Compliance:	WEEE, RoHS

Introducing the **NEW** Restek **ProFLOW 6000** Electronic Flowmeter

The ProFLOW 6000 is an electronic device capable of measuring volumetric flow for most gases.* Real-time measurements can be made for various types of flow paths, including continuously changing gas types.

SUPPLIES & ACCESSORIES

- Accuracy of $\pm 2\%$ of flow or ± 0.2 mL/min., whichever is greater.
- Over range warning indicator.
- Auto shut-off feature.
- Use as a bench-top or hand-held unit.
- Ergonomic design and side grips for comfort.
- Measures most gas types.*
- Convenient carrying/storage case included.
- Uses 2-AA batteries (included).
- Data output via USB port.
- 1-year warranty.
- Recalibration service available.



Hard-sided carrying case included with purchase of unit.



Optional soft-side case is ideal for storage in smaller spaces such as your tool box.

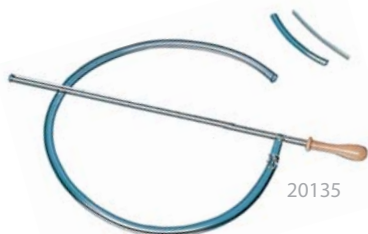
Description	qty.	cat.#	price
Restek ProFLOW 6000 Electronic Flowmeter with Hard-Sided Carrying Case	ea.	22656	
ProFLOW 6000 Recalibration Service	ea.	22656-R	
Soft-Side Storage Case	ea.	22657	

*The flowmeter is designed to measure clean, dry, non-corrosive gases.

Go to www.restek.com/flowmeter for details.

restek **recommends**

Recalibrate your ProFLOW 6000 Flowmeter once every year. Prolonged failure to recalibrate your unit may result in increased error. To always get the most accurate flow measurements, send in your flowmeter for recalibration (cat.# 22656-R).



Soap Film Bubble Flowmeter

- 1 mL flowmeter for flows between 0.1 and 10 cc/min.
- 50 mL flowmeter for flows between 10 and 300 cc/min.
- Includes a reservoir bulb, twenty-four inches (60 cm) of 1/4-inch ID tubing, adaptor tubes for 1/8-inch tubing and 0.53 mm ID capillary columns, and Velcro® fasteners.

Description	Volume	qty.	cat.#	price
Bubble Flowmeter	1mL	ea.	20135	
Bubble Flowmeter	50mL	ea.	20136	

Methane Cylinder Kit

Setting the column flow rate by injecting methane and optimizing linear velocity is a preferred method for establishing reproducible retention times (see Method E1510-93). The kit includes a Scotty® 14 cylinder containing methane in helium, a MINICYL adaptor, a syringe adaptor, and a pack of twenty-five septa for the adaptor.



Description	qty.	cat.#	price
Methane Cylinder Kit	kit	20197	
Replacement Septa for Syringe Adaptor	25-pk.	20198	
Replacement Methane Cylinder	ea.	20199	



Column not included.

Capillary Column Rinsing Reservoir Kit

Restore the performance of bonded-phase capillary columns by dissolving and removing soluble, nonvolatile residue, using this rinsing reservoir kit. The 50 ml rinsing reservoir is equipped with 1/4-inch inlet and outlet connections and includes a built-in fritted disk to prevent particulate matter from contaminating the column. The kit includes: reservoir, pressure regulator, fittings, ferrules, and tubing. Reservoir also available separately.

Description	qty.	cat.#	price
Rinsing Reservoir Complete Kit	kit	20612	
Rinsing Reservoir only	ea.	20613	



FID Flow Measuring Adaptor

- Makes setting flows easy.
- Meets or exceeds original manufacturer's performance.

Description	Similar to Agilent part #	qty.	cat.#	price
FID Flow Measuring Adaptor	19301-60660	ea.	21000	

Inlet and FID Maintenance Kits for Agilent GCs

- Include the most common consumable GC supplies and tools.
- All parts meet or exceed performance of instrument manufacturer's parts.
- Parts list makes reordering easy.

Inlet kit includes:

- 0.4, 0.5, and 0.8 mm ID graphite ferrules.
- Viton® O-rings.
- Capillary nuts.
- Inlet seals.



- Wire cleaning brush.
- Jet reamers/ferrule removers.
- Inlet liner removal tool.
- Septa nut removal tool.

FID kits include:

- 1/4", 0.4, 0.5, and 0.8 mm ID graphite ferrules.
- FID/NPD capillary adaptor.
- Capillary nuts.
- Jet reamers/ferrule removers.
- 1/4" nut.
- Scoring wafer.
- Capillary column caps.
- Ignitor for either Agilent 5890 or 6890/6850/7890 GCs.
- FID flow measuring adaptor.
- 1/4" x 5/16" wrench.
- Installation gauge.
- Wire cleaning brush.
- High-performance Siltek® treated FID jet for either Agilent 5890 (adaptable jet) or 6890/6850/7890 (dedicated jet) GCs.
- Spanner wrench.
- FID jet removal tool.



Description	qty.	cat.#	price
Inlet Maintenance Kit for Agilent 5890/6850/6890/7890 GCs	kit	22181	
FID Maintenance Kit for Agilent 5890 GCs	kit	22180	
FID Maintenance Kit for Agilent 6850/6890/7890 GCs	kit	22179	



22185



22186



22182



22184



MLE Tool Kits conveniently provide the tools that make it easier to install

SUPPLIES & ACCESSORIES

Make Life Easier (MLE) Capillary Tool Kits Everything you need in one complete kit!

All kits include these components:

- $\frac{1}{8}$ " $\frac{3}{16}$ " $\frac{1}{2}$ " nylon brushes
- $\frac{1}{4}$ " $\frac{3}{8}$ " $\frac{3}{16}$ " stainless steel wire tube brushes
- stainless steel surface brush
- 6 stainless steel jet reamers (0.25–0.65 mm OD)
- $\frac{1}{4}$ " x $\frac{5}{16}$ " open end wrench
- $\frac{3}{8}$ " x $\frac{7}{16}$ " open end wrench
- rubber-tipped slide-lock tweezers
- scoring wafers with handles
- inlet liner removal tool
- septum puller
- mini wool puller/insertor tool
- 4-inch tapered needle file
- swivel head flashlight
- mini hand drill set
- 15 cm compact steel ruler
- pocket magnifier
- high temperature string (1 meter)
- pipe cleaner (12-inch)
- cotton tip swabs (pk. of 25)

MLE Capillary Tool Kit for Agilent GCs (cat.# 22186) also includes:

- capillary installation gauge for Agilent GCs
- injector wrench for Agilent GCs
- septum nut removal tool
- $\frac{7}{16}$ " x $\frac{1}{2}$ " open end wrench
- $\frac{1}{2}$ " x $\frac{9}{16}$ " open end wrench

MLE Capillary Tool Kit for PerkinElmer GCs (cat.# 22185) also includes:

- $\frac{7}{16}$ " x $\frac{1}{2}$ " open end wrench
- $\frac{1}{2}$ " x $\frac{9}{16}$ " open end wrench

MLE Capillary Tool Kit for Shimadzu GCs (cat.# 22182) also includes:

- capillary installation gauge for Shimadzu GCs
- injector wrench for Shimadzu GCs
- 6 mm x 7 mm open end wrench
- 8 mm x 10 mm open end wrench
- 16 mm x 17 mm open end wrench

MLE Capillary Tool Kit for Thermo Scientific GCs (cat.# 22183) also includes:

- capillary installation gauge for Thermo Scientific GCs
- liner cap removing tool for Thermo Scientific GCs
- 6 mm x 7 mm open end wrench
- 8 mm x 10 mm open end wrench
- 16 mm x 17 mm open end wrench

MLE Capillary Tool Kit for Varian GCs (cat.# 22184) also includes:

- capillary installation gauge for Varian GCs
- $\frac{7}{16}$ " x $\frac{1}{2}$ " open end wrench
- $\frac{1}{2}$ " x $\frac{9}{16}$ " open end wrench

Description	qty.	cat.#	price
MLE Capillary Tool Kit for Agilent GCs	kit	22186	
MLE Capillary Tool Kit for PerkinElmer GCs	kit	22185	
MLE Capillary Tool Kit for Shimadzu GCs	kit	22182	
MLE Capillary Tool Kit for Thermo Scientific GCs	kit	22183	
MLE Capillary Tool Kit for Varian GCs	kit	22184	

Column Hanger
for Agilent 7890, 6890, 5890,
and 5880A GCs

Description	qty.	cat. #	price
Column Hanger for Agilent 7890, 6890, 5890, and 5880A GCs	ea.	22128	

Sapphire Scribe

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

20182



One quick stroke...

...and just a tap leaves a clean,
square end.

Description	qty.	cat. #	price
Sapphire Scribe	ea.	20182	

Scoring Wafer with Handle

- Ceramic wafer is serrated on one side and straight-edged on the other to cut both fused silica and metal tubing cleanly.
- Unique, ergonomic handle is made of soft, comfortable rubber.



Description
Scoring Wafer with Handle

r
e cuts
tubing

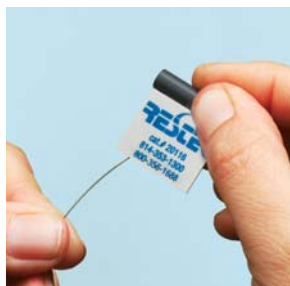
23026

Ceramic Scoring Wafer

- Four straight scoring edges for cutting fused silica tubing and four serrated edges for cutting MXT® metal capillary columns.
- Sure-grip handle included.



20116



Exert just enough pressure to put a slight arc in the tubing. The tubing should fall off or break with a slight tap of the wafer.

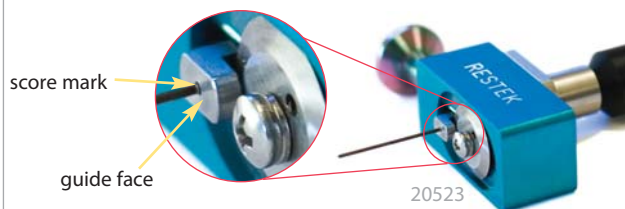


Check the cut against the white of the scoring wafer. Look for a clean, square cut.

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

Description	qty.	cat. #	price
Shortix Capillary GC Column Cutter	ea.	23026	
Maintenance Kit for Shortix Capillary GC Column Cutter (Includes: diamond cutting wheel, O-rings, and a tool to open the column cutter)	kit	23027	

Enlarged view—score mark flush with guide face.



20523

Restek Tubing Scorer

- Makes perfect cuts every time.
- Easy to use.
- Leaves column entrance perfectly round.

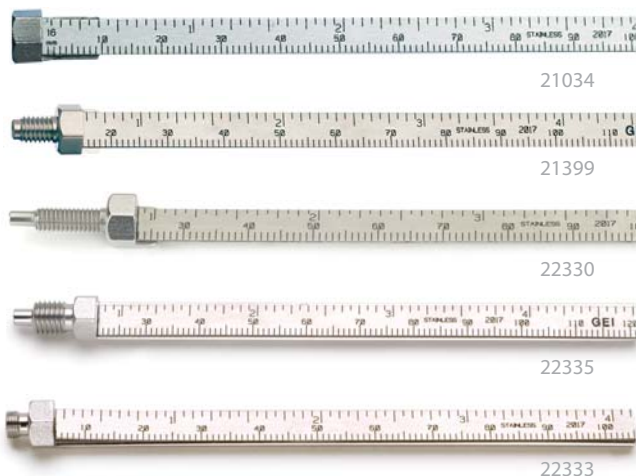
Metal MXT® columns are easy to cut. Scoring wafers can be used, but may leave the column end irregularly shaped. The Restek tubing scorer is designed to make a perfect cut every time, leaving the column entrance perfectly round.

Description	qty.	cat. #	price
Restek Tubing Scorer for MXT Columns (0.25-0.53mm ID & 0.5-0.8mm OD)	ea.	20523	
Replacement Scoring Wheel	ea.	20522	



www.restek.com 277

Easily seat ferrules for consistent installations!



Capillary Installation Gauge

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

Using the capillary installation



Tighten the assembly to ensure a properly seated ferrule. Loosen the assembly and remove the column and column nut.



The ferrule will be properly seated, and should remain in place when light force is applied. If it slides loosely on the column, repeat procedure.

Description	qty.	cat.#	price
Capillary Installation Gauge for Agilent-style fittings (compact ferrules)	ea.	21034	
Capillary Installation Gauge for 1/16" fittings (1/16" ferrules)	ea.	21399	
Capillary Installation Gauge for Thermo Scientific TRACE & Focus SSL (M4 ferrules)	ea.	22330	
Capillary Installation Gauge for Varian GCs for use with 1/16" ferrules	ea.	22335	
Capillary Installation Gauge for Shimadzu 17A, 2010, and 2014 GCs	ea.	22333	

*Recommended for use with graphite ferrules.



did you know?

Restek carries a complete line of replacement parts for Agilent GCs. See **pages 216-243** for more information.



21894

Capillary Installation Gauge

for Agilent 5973/5975 MS

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



Install the nut and ferrule onto the column, then insert the column through the installation tool, exposing several centimeters at the exit end, then tighten the nut on to the gauge.



Score and remove the exposed end of the column, then loosen the nut.



The ferrule will be properly seated and should remain in place when light force is applied. Install the column into the GC/MS interface.

Description	Similar to Agilent part #	qty.	cat.#	price
Capillary Installation Gauge for Agilent 5973/5975 MS	61000-90030	ea.	21894	



22858



21044

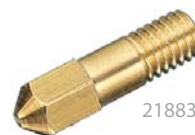
Capillary Column Caps

- Attach to the column in seconds to form an airtight seal.
- Increase column lifetime—prevent moisture and air from entering the column during storage.
- Two styles to choose from: glass or silicone material.
- Glass caps are color-coded for identifying detector and injector ends.
- Not recommended for reuse.

Description	Material	qty.	cat.#	price
Capillary Column Caps	glass	10-pk.	21044	
Capillary Column Caps	silicone	10-pk.	22858	

Injector/Detector Plug Nuts

- Use to cap off an injector to isolate leaks.
- Use to cap off a detector for thermal cleaning.
- Use to check a detector or make-up gas flow rate.
- Use to cap off a detector and prevent hydrogen from accidentally diffusing into the oven from an unused detector base.



21883

Description	Similar to Agilent part #	qty.	cat.#	price
Injector/Detector Plug Nuts	5020-8294	2-pk.	21883	

restek innovation!

No more burned fingers!

Inlet Liner Removal Tool

- Easily remove liner from injector—no more burned fingers.
- Made from high-temperature silicone.
- Won't chip or crack the liner.



Gently push the liner removal tool onto the liner in the injection port, with a slight circular motion.



Slowly pull the liner out of the injection port.



Use the liner removal tool to place a new liner into the injection port, avoiding hot metal.



Inlet Liner Packing Tool

- Position wool reproducibly every time.
- Accurate to a specific, measured depth.
- Can be used with all manufacturer's liners.



Loosen the nut on the side of the tool and adjust the gauge to the manufacturer's recommended depth.



Place a plug of loosely bound wool at the top of the inlet liner.



Insert the liner packing tool into the liner until the tool bottoms out. Remove the tool. The wool is now positioned correctly in the liner and the liner is ready for use.

Description

Inlet Liner Removal Tool

SUPPLIES & ACCESSORIES

qty.	cat.#	price
ea.	20339	

No more burned fingers!



The Claw and The Claw Holder Kit

- Easily removes hot liners from injection ports.
- 4mL vials (not included) can be replaced when dirty.

Never again will you have to burn your fingers removing a hot injection port liner. The Claw safely and cleanly removes liners, O-rings, or other small objects from the injection port. You can then place the hot objects in a clean 4 mL vial situated in the Claw holder until ready for reuse.



Description	qty.	cat. #	price
The Claw	ea.	26261	
The Claw Holder Kit (includes The Claw and holder)	kit	26262	
WISP 48 Snap Seal Vial	100-pk.	24658	



Mini Wool Puller/Inserter

Insert and remove wool plugs easily. Order a spare pack so you'll always have one available.

Description	qty.	cat.#	price
Mini Wool Puller/Inserter	2-pk.	20114	

Sky

Introducing Sky™ Liners

Inlet Liners

See page 206 for more details.

Rethreading Tool

- Repair worn or damaged threads.
- Multiple uses (fittings, injectors, detectors, etc.)
- Built-in guide to prevent cross-threading.



Repeated installation, removal, and temperature changes cause wear and damage to threads on GC parts. This can cause a poor seal, and oxygen can enter the system, compromising analytical results and possibly destroying expensive analytical columns.

**Achieve a better seal!**

Simply screw the rethreading tool onto the part, unscrew, and inspect the threads. Repeat as necessary. When done, wipe threads clean with methanol to remove any debris.

Description	qty.	cat.#	price
Rethreading Tool for 1/16" compression fitting	ea.	23016	
Rethreading Tool for 1/8" compression fitting	ea.	23017	
Rethreading Tool for 1/4" compression fitting (Agilent split/splitless injection ports)			
Rethreading Tool for 7/16" compression fitting (Varian injection ports)			
Rethreading Tool for 1/4" Varian-style capillary column fittings			

SUPPLIES & ACCESSORIES

Injector Wrench

for Agilent 5890/6890/6850 GCs

- Use to remove the septum nut and weldments during GC maintenance.
- Use the smaller end to remove the septum nut.
- Use the larger end to tighten the split/splitless weldment nut.
- High-quality stainless steel construction.
- Meets original equipment performance.



Description	Similar to Agilent part #	qty.	cat.#	price
Injector Wrench for Agilent 5890/6890/6850 GCs	19251-00100	ea.	22065	

**Injector Wrench**

for Shimadzu 17A, 2010, and 2014 GCs

- Designed specifically for removing Shimadzu injection ports.
- High-quality stainless steel construction.

Description	Similar to Shimadzu part #	qty.	cat.#	price
Injector Wrench for Shimadzu 17A, 2010, and 2014 GCs	221-46977-00	ea.	21159	

**Open-End Wrench Set**

for use with Shimadzu 17A, 2010, and 2014 Capillary Installation Gauge

Description	qty.	cat.#	price
1/4" x 5/16" and 10mm x 11mm Open-End Wrench Set for use with Shimadzu 17A, 2010, and 2014 Capillary Installation Gauge	ea.	22334	

**Open-End Wrench Set**

High-quality 1/4" x 5/16", 3/8" x 7/16", 7/16" x 1/2", and 1/2" x 9/16" wrenches for chromatography fittings.

Description	qty.	cat.#	price
Open-End Wrench Set	set	20387	

**Open-End Wrenches**

High-quality wrenches for tightening capillary fittings.

Description	Size	qty.	cat.#	price
Open-End Wrenches	1/4" x 5/16"	2-pk.	20110	
Open-End Wrenches	3/8" x 7/16"	2-pk.	22455	

**Metric Wrench Set**

High-quality 6 x 7 mm, 8 x 10 mm, and 16 x 17 mm wrenches for tightening a wide variety of fittings.

Description	qty.	cat.#	price
Metric Wrench Set	set	22997	



22999

Metric 9 Piece Ball-Point Hex Key Set

Includes 9 metric hex keys (Allen wrenches): 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10 mm.

Description	qty.	cat.#	price
Metric 9 Piece Ball-Point Hex Key Set	set	22999	



22998

12 Piece Ball-Point Hex Key Set

Includes 12 hex keys (Allen wrenches): .050", 1/16", 5/64", 3/32", 7/64", 1/8", 9/64", 5/32", 3/16", 7/32", 1/4", and 5/8".

Description	qty.	cat.#	price
12 Piece Ball-Point Hex Key Set			



20101

Slide-Lock Tweezers and 15 cm Compact Steel Ruler

- "Lock" capillary columns to the correct insertion distance recommended by the instrument manufacturer during installation.

- Useful for many laboratory tasks.

Description	qty.	cat.#	price
Slide-Lock Tweezers and 15cm Compact Steel Ruler	set	20101	



20112

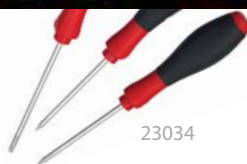
Stainless Steel Tube Brushes/Surface Brush

Unlike brass brushes that can leave a metal residue, these stainless steel tube brushes (3/8-, 3/16-, and 1/4-inch) work well for cleaning dirty collectors, injector ports, and detector ports. The surface that builds up on metal

SUPPLIES & ACCESSORIES

Torx® Screwdriver Set

- Set includes TR-10, TR-15, and TR-20.
- Ideal for performing routine maintenance on Agilent 6890 and 7890 GCs.



23034

Description	qty.	cat.#	price
Torx Screwdriver Set	set	23034	



20108

Nylon Tube Brushes and Pipe Cleaner

Use to remove small septum fragments and residue from dirty glass inlet liners. Brushes are 1/8-, 3/16-, and 1/4-inch in diameter; pipe cleaner is one foot (30cm) long.

Description	qty.	cat.#	price
Nylon Tube Brushes and Pipe Cleaner	4-piece set	20108	



20109

High-Temperature String

- Withstands temperatures to 400 °C.
- Use to restring capillary columns, attach column connectors to column cages, or hold a column in the GC oven.

Description	qty.	cat.#	price
High-Temperature String	10m	20109	
High-Temperature String	450m	20618	



20106

4" Tapered Needle Files

These files can be used for many purposes. They are especially useful for removing ferrules that are lodged in injector or detector ports.

Description	qty.	cat.#	price
4" Tapered Needle Files	2-pk.	20106	



21601

MXT® Needle Files

Multi-purpose files especially useful for cutting Siltek® treated stainless steel columns.

Description	qty.	cat.#	price
MXT Needle Files	2-pk.	21601	

Pocket Magnifier

- Small and easy to handle.
- 10x magnification makes it easy to see the column end to verify a square cut.



20124

Description	qty.	cat.#	price
Pocket Magnifier	ea.	20124	

GC Oven Thermometer

- Verify GC oven temperature.
- Quick measurements via sensor in the measuring tip.
- Swivel head can turn 180°.
- Wide measuring range: -50°C to +350°C.



22066

Description	qty.	cat.#	price
GC Oven Thermometer	ea.	22066	

Mini Hand Drill Set

Drill ferrules to the proper size for use with 0.25, 0.32, and 0.5 (ID) capillary columns.



22187

Description	qty.	cat.#	price
Mini Hand Drill Set	3-piece set	20122	

Flashlight with Swivel Head

qty.	cat.#	price
ea.	22187	



20113

Stainless Steel Jet Reamers

A great tool for cleaning detector jets or removing stuck ferrules from other small orifices. Serrated design is optimal for removing silica deposits and other contaminants.

Description	qty.	cat.#	price
Stainless Steel Jet Reamers	6-piece set	20113	

Septum Puller

- Use hooked end for removing septa and O-rings; pointed end works well for removing stuck ferrules or debris.
- Keep several on hand in your laboratory—can be used in many different ways.



Remove septum without damaging an expensive weldment.



Dislodge a stuck ferrule quickly and easily—without scoring the fitting.



20117

Description	qty.	cat.#	price
Septum Puller	ea.	20117	

save **money!**

You can save money on column installation tools by purchasing the MLE Capillary Tool Kits described on **page 276**.

Septum Nut Removal Tool

for Agilent 5890/6890/6850/7890 GCs

- Easily remove the septum nut without touching the heated nut—no more burned fingers!
- Unique, ergonomic handle—easy to grip.
- Nut remains in tool for quick reattachment.

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innovation!

24918



Slip tool over septum nut...



loosen nut...



and remove, avoiding hot metal surfaces.

Liner Cap Removing Tool

for Thermo Scientific GCs:

Focus GC / TRACE GC / Ultra/TRACE GC x GC

- Easily loosens the liner cap from the injector.
- Unique, ergonomic handle—easy to grip.

restek
innovation!

24937



Remove septum cap, septum holder, septum, and septum support.



Place tool on liner cap. Align two pins on bottom of tool with two open slots on liner cap.



Turn counter-clockwise to loosen liner cap.



Use tweezers (cat. #20101) to remove liner cap.

SUPPLIES & ACCESSORIES

DescriptionSeptum Nut Removal Tool
for Agilent 5890/6890/6850/7890 GCs

qty.	cat.#	price
ea.	24918	

Liner Cap Removing Tool
for Thermo Scientific GCs

qty.	cat.#	price
205 070 10	ea.	24937



Q-sep™

Complete Product Offering

to support AOAC (2007.01)
& European (EN 15662)
QuEChERS Methods

- Comprehensive portfolio of QuEChERS tubes.
- Method-specific internal and QC standards.
- Rxi®-5Sil MS Capillary column
- Ultra Aqueous C18 LC Column.
- Q-sep™ 3000 Centrifuge

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i tech tip

Choosing the Right Ferrule

Although graphite and Vespal®/graphite ferrules each have advantages and disadvantages, the choice of ferrule composition is largely a personal preference. Graphite ferrules are soft, easy to seal, stable to 450 °C, and contain no binders that might off-gas. Vespal®/graphite ferrules work better for vacuum and high-pressure applications (e.g., GC/MS) because they will not fragment or allow oxygen to permeate into the system, whereas graphite ferrules will. Because Vespal®/graphite ferrules are made from a harder material, they might require retightening after several temperature cycles. Alumaseal® ferrules are ideal for GC/MS. They will not crack or fragment and require no retightening after temperature cycles.

Vespal® Ferrules

- 100% high-temperature polyimide.
- Stable to 350 °C.
- Durable, leak-tight.



Vespal® ferrules

Graphite Ferrules

- Preconditioned to eliminate out-gassing.
- High-purity, high-density graphite.
- Smoother surface and cleaner edges than conventional graphite ferrules.
- Contain no binders that can off-gas or adsorb analytes.
- Stable to 450 °C.

Vespal®/Graphite Ferrules

- 60%/40% Vespal®/graphite blend, offering the best combination of sealing and ease of workability.
- Seal with minimal torque, reusable, and preferred for vacuum and high-pressure uses.
- Stable to 400 °C.
- Recommended for mass spec transfer lines.

Capillary Ferrules

for 1/16-Inch Compression-Type Fittings

Available in Vespal®, graphite, or Vespal®/graphite.



graphite ferrules

SUPPLIES & ACCESSORIES

Ferrule ID	Fits Column ID	qty.	Vespal	Graphite	Vespal/Graphite
					20275
					20211
					20229
					20212
					20231
					20232
					20213
					20230
1.0mm	0.75mm	10-pk.	22217	21058	24912
1.2mm	0.75mm*	10-pk.	22218	—	—
1.6mm	1.00mm*	10-pk.	—	21060	—

Encapsulated Ferrules

for 1/16-Inch Compression Fittings

- Reusable—will not deform and stick in fittings.
- Less torque needed to seal ferrule.
- Restek's unique blend of graphite minimizes fragmentation and outgassing.



Reusable!

graphite ferrules

Ferrule ID	Fits Column ID	qty.	cat.#	price
0.4mm	0.25mm	10-pk.	21036	
0.5mm	0.32mm	10-pk.	21037	
0.8mm	0.53mm	10-pk.	21038	

Compact Ferrules

for Agilent 5890/6890/6850/7890 GCs

Available in graphite or Vespal®/graphite.



graphite ferrules

Ferrule ID	Fits Column ID	qty.	Graphite	Vespal/Graphite
0.4mm	0.25/0.28mm	10-pk.	20250	20238
0.4mm	0.25/0.28mm	50-pk.	20251	20239
0.5mm	0.32mm	10-pk.	21007	20248
0.5mm	0.32mm	50-pk.	21008	20249
0.8mm	0.45/0.53mm	10-pk.	20252	20263
0.8mm	0.45/0.53mm	50-pk.	20253	20264
1.0mm	0.75mm*	10-pk.	21059	—
1.6mm	1.00mm*	10-pk.	21061	—

*For micropacked columns.

**For 0.28 mm MXT columns.

Standard Ferrules

for 1/16", 1/8", and 1/4-Inch Fittings

Available in Vespel®, graphite, or Vespel®/graphite.

Fitting Size	Ferrule ID	qty.	Vespel	Graphite	Vespel/Graphite
1/4"	3/16"	5-pk.	—	—	20258
1/16"	1/16"	10-pk.	22210	20207	20218
1/8"	1/8"	10-pk.	22211	20208	20219
1/8"	reduce to 1/16"	10-pk.	—	20209	20220
1/4"	1/4"	10-pk.	22212	20210	20221
1/4"	reduce to 1/8"	10-pk.	22219	20225	20222
1/4"	reduce to 1/16"	10-pk.	—	20226	20223

**Two-Hole Ferrules**

for 1/8-Inch and 1/16-Inch Compression-Type Fittings

Fitting Size	Ferrule ID	Fits Column ID	qty.	Vespel/Graphite
1/16"	0.4mm	0.25/0.28mm	5-pk.	24848
1/16"	0.5mm	0.32mm	5-pk.	24849
1/8"	0.8mm	0.45/0.53mm	5-pk.	20246

**Reducing Ferrules**

Available in graphite or Vespel®/graphite.

Fitting Size	Ferrule ID	Fits Column ID	qty.	Graphite	Vespel/Graphite
1/8"	0.4mm				
1/8"	0.5mm				
1/8"	0.8mm				
1/4"	0.4mm				
1/4"	0.5mm				
1/4"	0.8mm				

SUPPLIES & ACCESSORIES

Blank Ferrules

for 1/16-Inch Fittings

Fitting Size	Ferrule ID	qty.	Vespel/Graphite
1/16"	no hole	10-pk.	20240

**Alumaseal® Ferrules***

- Aluminum construction—will not crack or fragment.
- No retightening required after temperature cycles—excellent for GC/MS.
- Eliminate out-gassing, make leak-tight seals, for less detector noise.
- Unique two-piece design permanently locks on fused silica tubing without causing breakage.
- Will not stick in fittings, unlike Vespel® or graphite.
- Stable to 550 °C.
- Use with any 1/16" compression-type fitting.

Ferrule ID	Fits Column ID	qty.	cat.#	price
0.4mm	0.25mm	10-pk.	21472	
0.5mm	0.32mm	10-pk.	21473	
0.8mm	0.53mm	10-pk.	21474	

*Patent pending.



restek
innovation!

**Alumaseal®
Ferrules**

- Will not crack or fragment.
- Excellent for GC/MS.

Ferrules

**Teflon® Ferrules**

- Upper temperature limit 250 °C.
- 100% Teflon®; completely inert.
- One-piece design requires no back ferrule.

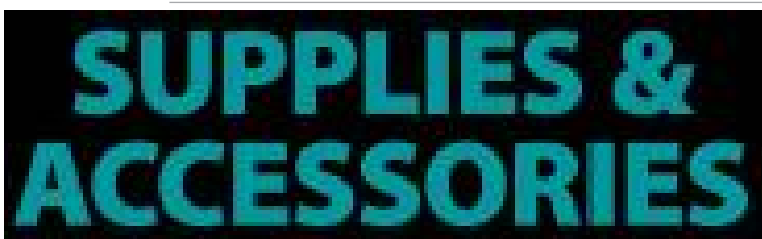
Fitting Size	Ferrule ID	qty.	cat.#	price
1/16"	1/16"	10-pk.	21122	
1/16"	0.4mm	10-pk.	21123	
1/16"	0.5mm	10-pk.	21124	
1/16"	0.8mm	10-pk.	21125	
1/8"	1/8"	10-pk.	21126	
3/16"	3/16"	10-pk.	21127	
1/4"	1/4"	10-pk.	21128	

Graphite Ferrules

(M4 Fittings) for Thermo Scientific TRACE, 8000, 8000 TOP & Focus GCs

- Preconditioned to eliminate out-gassing.
- High-purity, high-density graphite.
- Smoother surface and cleaner edges than conventional graphite ferrules.
- Contain no binders that can off-gas or adsorb analytes.
- Stable to 450 °C.

Ferrule ID	Fits Column ID	Similar to TS part #	Graphite 2-pk. price	Graphite 10-pk. price
0.3mm	0.10/0.15mm	—	22221	22222



for Shimadzu 17A GCs

- For use with packed columns.
- Graphite construction.

Description	qty.	cat.#	price
5mm Ferrules for Shimadzu 17A GCs	10-pk.	21121	

Graphite Ferrules

for Shimadzu 17A, 2010, & 2014 GCs

- Graphite 2-piece construction.
- Available in 0.4, 0.5, and 0.8 mm sizes.
- Packaged on mandrel for easy handling.

Ferrule ID	Fits Column ID	Similar to Shimadzu part #	qty.	cat.#	price
0.4mm	0.25mm and less	220-90765-00	10-pk.	24827	
0.5mm	0.32mm	221-32126-05	10-pk.	24828	
0.8mm	0.53mm	221-32126-08	10-pk.	24829	

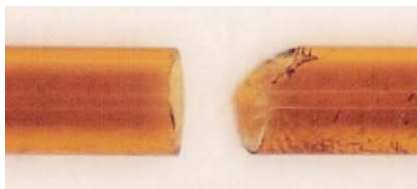
also available

Restek carries Swagelok® fittings in brass & stainless steel.See pages 313-315 or visit www.restek.com and search on Swagelok.

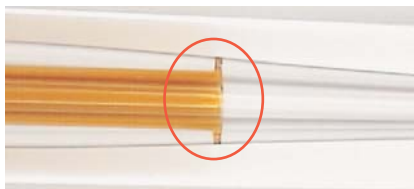
Restek Press-Tight® Connectors

Press-Tight® connectors are lightweight, quickly installed, and easy to use. They connect fused silica tubing having outside diameters ranging from 0.33 to 0.74 mm (Restek 0.1 to 0.53 mm ID). Press-Tight® connectors do not cause solvent tailing, or adsorb active compounds.

Press-Tight® connectors most often are used to connect a guard column to an analytical column. They also are used to connect columns differing in polarity, for unique separations, or to repair a broken column.



Make a clean, square cut for optimum connector performance. The cut on the right will produce a poor seal.



A brown ring indicates a proper seal.

Obtaining a leak-tight seal:

To achieve optimum performance from these connectors, begin with a properly cut fused silica column or retention gap end. Even if you use polyimide resin (cat.# 20445, page 288) for extra insurance, a poorly cut capillary column will make an inadequate seal.

Press the cut ends into the connector. Use a Restek Electronic Leak Detector to check the seal. The seal is made permanent as the resin cures on the inner surface of the connector.

What is the maximum temperature?

Press-Tight® connectors are effective at oven temperatures to 325 °C, the temperature at which the polyimide coating on the column decomposes and the connection will begin to leak. We strongly recommend using a Vu2 Union® (page 289) or SeCure® "Y" Connector (page 290) connector if oven temperatures will exceed 325 °C for prolonged periods of time.

Can Press-Tight® connectors be used with MXT® columns?

No. To achieve a leak-tight fused silica to stainless steel connection, we recommend an MXT® connector (see page 292).

Turn the page for a complete list of Restek Press-Tight® Connectors.

SUPPLIES & ACCESSORIES

Let Restek Make the Connection!

Secure, reliable column-to-column connections!

Guard column connected to an analytical column using a Vu2 Union® connector.

Restek will connect a guard column/transfer line to any analytical column, using a Vu2 Union® connector. We will leak-check the connection and confirm analytical integrity by analyzing a test mixture. To order a preconnected guard column/transfer line, add the three-digit suffix from the chart below to any analytical column catalog number. Example: A 5 m, 0.32 mm ID guard column connected to a 30 m, 0.32 mm ID, 1.0 µm Rtx®-5 column is cat.# 10254-163.

5m Guard Column	cat.# suffix	Additional Cost*
0.15mm ID	-160	
0.18mm ID	-161	
0.25mm ID	-162	
0.32mm ID	-163	
0.53mm ID	-164	
10m Guard Column	cat.# suffix	Additional Cost*
0.25mm ID	-165	
0.32mm ID	-166	
0.53mm ID	-167	

Guard columns listed are intermediate polarity (IP) deactivated.

For more information about guard columns and other deactivations, see pages 31–35.

*Additional cost will be added to the price of the column.

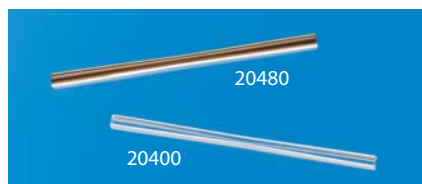


Press-Tight® Connectors

- Deactivated Press-Tight® connectors assure better recovery of polar and nonpolar compounds.
- Siltek® treated connectors are ideal for organochlorine pesticides analysis.
- Fit column ODs from 0.33–0.74 mm (Restek 0.1 mm–0.53 mm ID).

Universal Press-Tight® Connectors

- Connect a guard column to an analytical column.
- Repair a broken column.
- Connect a column outlet to a transfer line.



Description	5-pk./price	25-pk./price	100-pk./price
Universal Press-Tight Connectors	20400	20401	20402
Universal Press-Tight Connectors, Deactivated	20429	20430	
Universal Press-Tight Connectors, Siltek Treated	20480	20449	

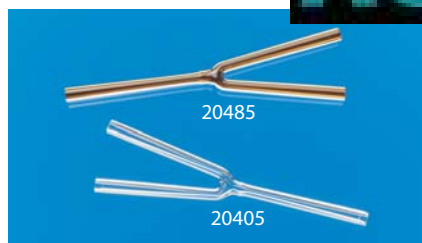
Universal Angled Press-Tight® Connectors

- Ideal for connecting a guard column to an analytical column.
- Angle approximates the curvature of a capillary column, reduces strain on column-end connections.



Description	5-pk./price	25-pk./price	100-pk./price
			20448
			20448-261
			20484

SUPPLIES & ACCESSORIES



Single injection confirmational analyses!

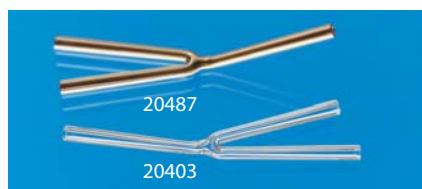
An alternative method of performing dual-column confirmational analyses!

- Split sample flow onto two columns.
- Split a single column flow to two detectors—perform confirmation analysis with a single injection.

Description	ea./price	3-pk./price
Universal "Y" Press-Tight Connector	20405	20406
Universal "Y" Press-Tight Connector, Deactivated	20405-261	20406-261
Universal "Y" Press-Tight Connector, Siltek Treated	20485	20486

Universal Angled "Y" Press-Tight® Connectors

- Perform confirmation analysis with a single injection.
- Inlet and outlet ends conform to the column curvature—alleviates column-end connection strain.



Description	ea./price	3-pk./price
Universal Angled "Y" Press-Tight Connector	20403	20404
Universal Angled "Y" Press-Tight Connector, Deactivated	20403-261	20404-261
Universal Angled "Y" Press-Tight Connector, Siltek Treated	20487	20469



Polyimide Resin

Securely connects a Press-Tight® connector to a fused silica column.

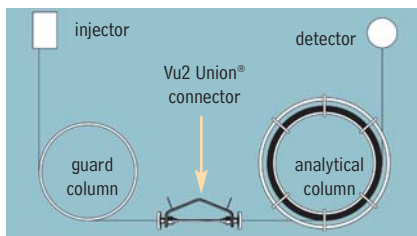
Description	Max. Temp.	qty.	cat.#	price
Polyimide Resin	350°C	5 grams	20445	

Vu2 Union® Connectors

- Connect a guard column to an analytical column.
- Connect a column to a transfer line.
- Connect two columns in series.
- Repair a broken column.
- Fit both Restek cage designs.

Restek's Vu2 Union® connector combines the simplicity of a Press-Tight® union with the strength of a metal union.

A guard column connected to an analytical column by a Vu2 Union® connector.



Fit both Restek cage designs.



Patent pending.

How does a Vu2 Union® connector work?

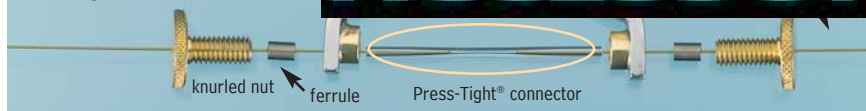
A Press-Tight® union in the Vu2 Union® connector joins the fused silica ends together; the ferrule and knurled nut at each end of the connector hold the tubing in place via a secondary seal between the ferrule and the Press-Tight® union. Each knurled nut applies independent pressure to each ferrule, to make a leak-tight seal with the column end. These ultra-strong connections will not unexpectedly disconnect under temperature changes, vibrations, or other stresses normally encountered in GC analyses. The open design allows visual confirmation of the seal between the column and the Press-Tight® union, to ensure confidence in the connection. Hang the connector from the column cage, to minimize stress on the connections.

Who will benefit from using Vu2 Union® connectors?

Any analyst using guard columns, transfer lines, or restrictor tubing, performing a dual-column analysis with columns of different diameters, will find Vu2 Union® connectors a valuable addition to their connection needs.

The Vu2 Union® connector's open design allows visual confirmation of the seal; secondary seals ensure a leak-tight connection.

SUPPLIES & ACCESSORIES



...e, reliable
...to-column
...connections!

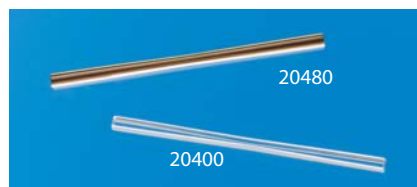
NOTE: This product is not recommended for GC column-to-MS connections—use the Vacuum Vu-Union®. See page 291.

Kits include: Vu2 Union® body, 2 knurled nuts, 2 Press-Tight® unions, and 4 ferrules

Description	Ferrules Fit Column ID	qty.	cat.#	price
Vu2 Union Connector Kit	0.10/0.15mm	kit	22220	
Vu2 Union Connector Kit	0.18/0.28mm	kit	21105	
Vu2 Union Connector Kit	0.32mm	kit	21106	
Vu2 Union Connector Kit	0.45/0.53mm	kit	21107	
Knurled nut		2-pk.	21108	

Universal Press-Tight® Connectors

Description	5-pk./price	25-pk./price	100-pk./price
Universal Press-Tight Connectors	20400 \$49.50	20401 \$198	20402
Universal Press-Tight Connectors, Deactivated	20429 \$57.50	20430 \$228	
Universal Press-Tight Connectors, Siltek Treated	20480 \$62	20449 \$259	

**Graphite Ferrules**

for Vu2 Union® Connectors

- High-purity, high-density graphite.
- Stable to 450 °C.
- No binders that can off-gas or adsorb analytes.
- Smooth surface and clean edges.

Ferrule ID	Fits Column ID	Graphite 2-pk./price	Graphite 10-pk./price
0.3mm	0.10/0.15mm	22221 \$23	22222
0.4mm	0.18/0.28mm	20280 \$23	20281
0.5mm	0.32mm	20282 \$23	20283
0.8mm	0.45/0.53mm	20284 \$23	20285



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11/12

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289

restek
innovation!



Fit both Restek cage designs.



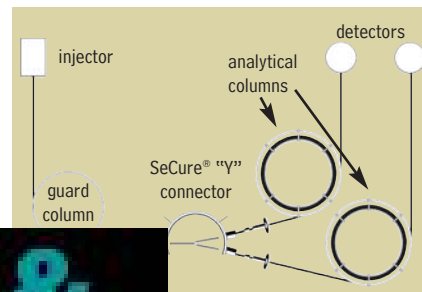
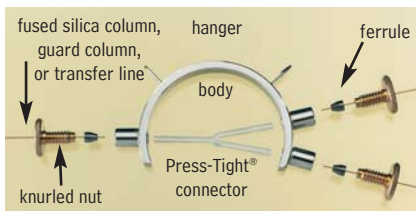
SeCure® "Y" Connector Kits

- Connect two analytical columns to a transfer line or guard column.
- Use standard "Y" Press-Tight® connectors and 1/16" graphite ferrules.
- Reliable seal integrity, will not unexpectedly disconnect during temperature-programmed analyses.
- Open design allows visual confirmation of the seal for added confidence in the connection.
- Fit both Restek cage designs.

Combine the simplicity of a "Y" Press-Tight® connector with the strength of a metal union. The ferrules and knurled nuts hold the fused silica tubing in place, which prevents the tubing from unexpectedly disconnecting, even at temperatures as high as 400 °C.

The SeCure® "Y" Connector's open design allows visual confirmation of the seal.

Dual-column confirmational analysis with a single injection—one of the SeCure® "Y" connector's many uses.



Patent pending

SUPPLIES & ACCESSORIES

Secure, reliable
column-to-column
connections!

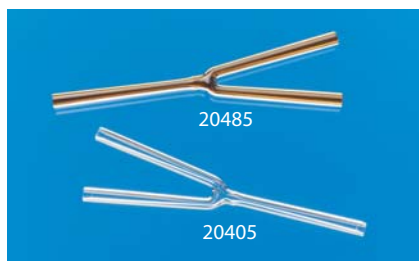
"Y" Universal Press-Tight®

qty.	cat.#	price
kit	20276	
kit	20277	
kit	20278	
3-pk.	20279	

Universal "Y" Press-Tight® Connectors

An alternative method of performing dual-column confirmational analyses!

- Split sample flow onto two columns.
- Split a single column flow to two detectors—perform confirmation analysis with a single injection.
- Deactivated Press-Tight® connectors assure better recovery of polar and nonpolar compounds.
- Siltek® treated connectors are ideal for organochlorine pesticides analysis.
- Fit column ODs from 0.33–0.74 mm (Restek 0.1 mm–0.53 mm ID).



Description	ea./price	3-pk./price
Universal "Y" Press-Tight Connector	20405 \$78	20406
Universal "Y" Press-Tight Connector, Deactivated	20405-261 \$79	20406-261
Universal "Y" Press-Tight Connector, Siltek Treated	20485 \$80.50	20486

Graphite Ferrules

for SeCure® "Y" Connectors

- Preconditioned to minimize out-gassing.
- High-purity, high-density graphite.
- Stable to 450 °C.
- No binders that can off-gas or adsorb analytes.
- Smooth surface and clean edges.



Ferrule ID	Fits Column ID	Graphite 10-pk./price	Graphite 50-pk./price
0.4mm	0.10/0.15/0.18/0.25/0.28mm	20200 \$32	20227
0.5mm	0.32mm	20201 \$32	20228
0.8mm	0.45/0.53mm	20202 \$32	20224



20427

Vacuum Vu-Union® Connector for GC/MS Applications

- Connects analytical column to MS transfer line.
- Use under vacuum conditions.
- Use only with Vu-Union® Vespel®/graphite ferrules (order ferrules separately).
- Includes metal housing body, one deactivated tapered glass insert, and Vu-Union® Helping Hand.
- Fits column ODs from 0.33–0.74 mm (Restek 0.1 mm–0.53 mm ID).

A specifically designed Vu-Union® glass insert permits more torque to be applied to the ferrules without fear of cracking the insert. The hex end nuts enable you to use wrenches to tighten the end fittings.

Vu-Union® Helping Hand

The Helping Hand is designed to hold in place the metal housing of the Vacuum Vu-Union® connector. This allows you to easily assemble the columns in the glass insert and tighten the nuts. The Helping Hand is included with the Vacuum Vu-Union® connector.

**Description**

Vacuum Vu-Union Connector (with the Helping Hand)
Replacement Inserts



20422

Vu-Union® Vespel®/Graphite Ferrules

- Use with Vacuum Vu-Union® connectors.
- 60% Vespel®/40% graphite.
- 400 °C maximum operating temperature.

Ferrule ID	Fits Column	qty.	cat.#	price
0.3mm	< 0.22mm ID/ < 0.4mm OD	10-pk.	20423	
0.4mm	0.25mm ID/0.4mm OD	10-pk.	20420	
0.5mm	0.32mm ID/0.5mm OD	10-pk.	20421	
0.8mm	0.45/0.53mm ID/0.8mm OD	10-pk.	20422	



20272



20270

Gerstel GRAPHPACK® 3D/2 Connectors & Ferrules

GRAPHPACK® technology provides a complete system that quickly and reliably makes a leak-tight, low-dead-volume connection. The central component is a metal-jacketed graphite ferrule—the ideal seal for GC applications.

Gerstel GRAPHPACK® 3D/2 Connectors

Description	Fits Column ID	qty.	cat.#	price
GRAPHPACK 3D/2 Connector*	0.25mm to 0.32mm ID	ea.	20272	
GRAPHPACK 3D/2 Connector*	0.45mm to 0.7mm ID	ea.	20273	

GRAPHPACK® 3D/2 Ferrules

Ferrule ID	Fits Column ID	qty.	cat.#	price
0.4mm	0.25mm	10-pk.	20271	
0.5mm	0.32mm	10-pk.	20270	
0.8mm	0.45/0.53mm	10-pk.	20274	

SUPPLIES & ACCESSORIES

qty.	cat.#	price
10-pk.	22223	
10-pk.	22224	
10-pk.	22225	



20146

Ferrule Removal Kit

The tapered tools in this kit have teeth designed to grip and remove fused silica adaptor ferrules that have become stuck in the fitting detail. Each kit has two tools: one for removing 1/32-inch adaptor ferrules and one for removing 1/16-inch adaptor ferrules.

Description	Valco #	qty.	cat.#	price
Ferrule Removal Kit	FRK1	kit	20146	

**Coupling GC Columns**

An MXT® connector is a good alternative to a glass connector when coupling GC columns. This connector is constructed from stainless steel and will not break; it uses ferrules for sealing. The design ensures low dead volume, and Siltek® treatment ensures the MXT® connector is inert—both features help minimize peak tailing. MXT® connectors can be used to connect metal-to-metal, metal-to-fused silica, or fused silica-to-fused silica tubing. When connecting metal tubing, use 1/32-inch stainless steel ferrules (listed above); for fused silica tubing, use Valcon polyimide adaptor ferrules (see page 292).



20388

1/4-Inch–3/16-Inch Open-End Wrenches

High-quality miniature wrenches to use with MXT® low-dead-volume connectors.

Description	qty.	cat.#	price
1/4"-3/16" Open-End Wrenches	2-piece set	20388	

MXT®-Union Connector Kits for Fused Silica Columns

- Low-dead-volume, leak-tight connection.
- Reusable.
- Siltek® treatment ensures maximum inertness.
- Ideal for connecting a guard column or transfer line to an analytical column.
- Use to oven temperatures of 360 °C.
- Available in union and “Y” configurations.
- Can also be used for fused silica to metal connections.

These MXT® connectors can be used with fused silica tubing, because of a Valcon polyimide 1/32-inch one-piece fused silica adaptor. This unique graphite-reinforced composite allows a capillary column to slide into the adaptor and be locked in place simply by loosening and tightening the fitting.

MXT®-Union Connector Kits for Fused Silica Columns

Each kit contains the MXT® union, two 1/32-inch nuts and two one-piece fused silica adaptors.



Description

For 0.25mm ID Fused Silica Columns
For 0.32mm ID Fused Silica Columns
For 0.53mm ID Fused Silica Columns

MXT® “Y”-Union Connector for Fused Silica Columns

Each kit contains the MXT® union, three 1/32-inch nuts and three one-piece fused silica adaptors.

Description	qty.	cat.#	price
For 0.25mm ID Fused Silica Columns	kit	21389	
For 0.32mm ID Fused Silica Columns	kit	21388	
For 0.53mm ID Fused Silica Columns	kit	21387	



Adaptor
Ferrules



20389

1/32-Inch Valco® Adaptor Ferrules (Valcon Polyimide)

Fused silica adaptor ferrules are Valcon polyimide, a unique graphite-reinforced composite, specially prepared to maximize mechanical stability at temperatures to 350 °C. The determining factor for selecting adaptor ferrule size is the fused silica tubing OD.

Tubing OD	Tubing ID	Valco #	qty.	cat.#	price
0.25 ≤ 0.40mm	0.25mm	FS.4-5	5-pk.	20137	
0.40 ≤ 0.50mm	0.32mm	FS.5-5	5-pk.	20140	
0.50 ≤ 0.80mm	0.53mm	ZF.5V-5	5-pk.	20141	
1/8" Replacement Nut			5-pk.	20389	

MXT® Low-Dead-Volume Connector Kits for Metal Columns

These low-dead-volume connectors are Siltek® treated to make them inert to active compounds, just like our MXT® columns. They can be used at temperatures up to 430 °C without degrading the deactivated layer. Purchase the appropriate ferrules for connecting 0.28, 0.32 or 0.53 mm ID tubing.

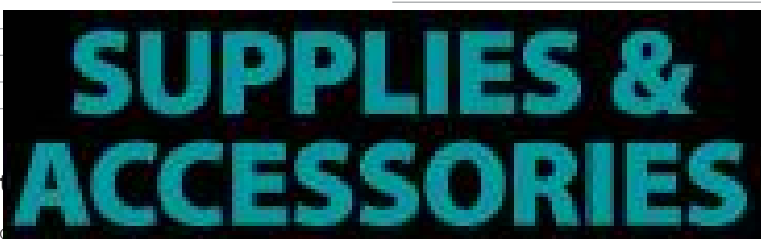
MXT® Low-Dead-Volume Connector Kits for Metal Columns

- Connect a guard column/transfer line to an MXT® stainless steel column.
- Low thermal mass tracks rapid oven temperature programming.
- Stainless steel ferrules and nuts.
- Available in “Y” and union configurations.
- Siltek® treatment ensures ultimate inertness.



Each kit contains the MXT® union, two 1/32-inch ferrules and nuts.

Description	qty.	cat.#	price
For 0.28mm ID MXT Columns	kit	20397	
	kit	20536	
	kit	20394	



to two detectors.

Each kit contains the MXT® union, three 1/32-inch ferrules and nuts.

Description	qty.	cat.#	price
For 0.28mm ID MXT Columns	kit	20396	
For 0.32mm ID MXT Columns	kit	20537	
For 0.53mm ID MXT Columns	kit	20395	



Replacement Ferrules (1/32-Inch Stainless Steel) for MXT® Connectors



Ferrule ID	Fits Column ID	qty.	cat.#	price
0.59mm	0.28mm	10-pk.	20398	
0.53mm	0.32mm	10-pk.	20535	
0.79mm	0.53mm	10-pk.	20399	

**Zero-Dead-Volume Valco® Internal Union**

Ends of tubing seat squarely at bottoms of fitting details. 300 series stainless steel. For 1/16" OD tubing. Stainless steel ferrules included.

Description	Union Bore	Valco #	qty.	cat.#	price
Internal Union	0.15mm	ZU1XC	ea.	20147	
Internal Union	0.25mm	ZU1C	ea.	20148	
Internal Union	0.75mm	ZU1	ea.	20149	
Internal Union	1/16"	ZU1T	ea.	20150	

**Zero-Dead-Volume Valco® Internal Reducing Union**

Connect two sizes of tubing, using zero-dead-volume fittings on each end. For 1/8" to 1/16" OD tubing. Stainless steel ferrules included.

Description	Union Bore
Internal Reducing Union	0.25mm
Internal Reducing Union	0.75mm
Internal Reducing Union	1/16"

**Zero-Dead-Volume Valco® Internal Tee**

Connect three lines. 300 series stainless steel; stainless steel ferrules included. For 1/16" OD tubing.

Description	Union Bore	Valco #	qty.	cat.#	price
Internal Tee	0.25mm	ZT1C	ea.	20154	
Internal Tee	0.75mm	ZT1	ea.	20155	

**Zero-Dead-Volume Valco® Internal Cross**

Connect four lines. 300 series stainless steel; stainless steel ferrules included. For 1/16" OD tubing.

Description	Union Bore	Valco #	qty.	cat.#	price
Internal Cross	0.25mm	ZX1C	ea.	20156	
Internal Cross	0.75mm	ZX1	ea.	20157	

**Male Pipe to Valco® Internal Adapter**

Makes a minimum volume connection from a female pipe fitting on a pressure gauge or regulator to a Valco® zero-dead-volume fitting. 300 series stainless steel; stainless steel ferrules included.

Description	Fitting Size	Bore	Valco #	qty.	cat.#	price
Male Pipe to Valco	1/4" NPT Male					
Internal Adapter	to 1/16" ZDV	1.0mm	PZA21	ea.	20158	
Male Pipe to Valco	1/4" NPT Male					
Internal Adapter	to 1/16" ZDV	1.0mm	PZA41	ea.	20159	

SUPPLIES & ACCESSORIES

qty.	cat.#	price
10-pk.	20286	
10-pk.	20287	

**1/16-Inch Valco® Adaptor Ferrules**

Tubing OD	Tubing ID	Valco #	qty.	Valcon Polyimide		qty.	Polyimide	
				cat.#	price		cat.#	price
0.25–0.4mm	0.1–0.25mm	FS1.4-5	5-pk.	20142		2-pk.	21015	
0.4–0.5mm	0.32mm	FS1.5-5	5-pk.	20143		2-pk.	21016	
0.5–0.8mm	0.53mm	FS1.8-5	5-pk.	20144		—	—	
0.8mm (1/32")	—	FS1.9-5	5-pk.	20145		—	—	

also available**Treated Fittings!**

See pages 313-317 for our Siltek®/Sulfinert® treated and Silcosteel®-CR treated fittings, as well as many more brass and stainless steel fittings from Swagelok® and Parker®.



GC ACCESSORIES

GAS PURIFICATION ESSENTIALS

Gas Purification Solutions	295
Gas Purification	296-303
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Gas Regulators & Accessories	309-312
Fittings	313-317
Tubing & Valves	318-322
VCO Fittings	322
Installation Tools	323
Tubing & Fitting Tools	324-325

SUPPLIES & ACCESSORIES

Restek provides the following total gas system solution:

- Restek gas purifiers provide cost-effective gas purity assurance.
- Restek stainless steel and copper tubing, precleaned and ready to use.
- Swagelok® and Parker A-Lok® tube fittings consistently deliver high-quality performance.
- Extensive line of hand tools to make your work easier and faster, including Restek's Electronic Leak Detector.
- Gas generators for an uninterrupted supply of gas.
- Gas regulators for optimum line pressure control of all your chromatography gases.

Restek's Technical Service Team (800-356-1688, ext. 4 or support@restek.com) or your Restek representative can answer your questions and provide system-design advice. From the gas source to your point of use, we offer the products and services that ensure the purity of your gas.



Why do I need to use traps and where should I install them?

Carrier gas must contain less than 1 ppm of oxygen, water vapor, or any other trace contaminant, to prevent column degradation, shortened column lifetime, and increased stationary phase bleed. Contaminants cause ghost peaks to appear during temperature programming and degrade the validity of analytical data. The expense of using high-purity gases in combination with carrier gas purifiers will be offset by longer column lifetime and less instrument maintenance.

Moisture Removal

Moisture in carrier gas lines will prematurely degrade oxygen and hydrocarbon traps and increase detector noise (particularly with ECDs). As a precaution, we highly recommend installing a moisture trap before the hydrocarbon and oxygen traps on all carrier gas lines. Our favorite trap is the Super-Clean Ultra-High Capacity Moisture Filter (cat.# 22028, pg. 299).

Hydrocarbon Removal

Use a hydrocarbon trap if your gas has a potential source of hydrocarbon contaminants (e.g., an oil pump in an air compressor) or if you suspect you are observing carrier gas ghost peaks. Install the hydrocarbon trap after the moisture trap, to prevent moisture from degrading the hydrocarbon-trapping ability of the activated carbon in the hydrocarbon trap. We recommend the Super-Clean Ultra-High Capacity Hydrocarbon Filter (cat.# 22030, pg. 299).

Oxygen Removal

Oxygen is a column killer and can enter the system at any connection which is leaking. It is present even in ultra high purity gases, as minute leaks at fittings allow oxygen to influx against the concentration gradient. There are many choices for oxygen removal—the Super-Clean Ultra-High Capacity Oxygen Filter (cat.# 22029, pg. 299) is popular with Restek chemists. Because oxygen can enter a gas line at any fitting, the oxygen trap should be the last connection before the gas line enters the chromatograph.

Leak Checking

To prevent column degradation, increase column lifetime, and decrease stationary phase bleed, carrier gas should always contain <1 ppm oxygen. This can be monitored by continually leak checking all gas system connections using Restek's Electronic Leak Detector (cat.# 22839, page 296).

for **more** info

Questions about which carrier gas purifier to use?

Call 800-356-1688 or 814-353-1300, ext. 4, or contact your Restek representative to discuss your application with our technical service chemists.



www.restek.com **295**

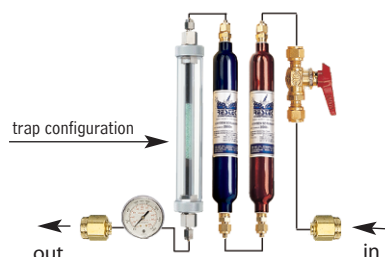
Restek Gas Management System

- Removes moisture, hydrocarbons, and oxygen from carrier gas, extending column lifetime.
- Produces high-purity carrier gas for most applications.
- Includes one each: moisture, hydrocarbon, and indicating oxygen trap.
- Replacing traps is safe and easy.
- Maximum flow: 1 liter/minute.



Dimensions:
 12" x 14" x 3"
 (30.5 x 35.6 x 7.6 cm)

Restek has put together a convenient unit providing gas purification all in one step. Complete with an indicating trap, your gas purification issues are handled in one central location.



did you know?

The Restek Gas Management System removes water vapor (to 10 ppb), hydrocarbons (to 0.1 ppm), and oxygen (to less than 0.1 ppm) with three traps housed in one unit.

SUPPLIES & ACCESSORIES

Description	Fittings	qty.	cat.#	price
Restek Gas Management System	includes fittings for 1/8" and 1/4" gas line	kit	21999	
		qty.	cat.#	price
		ea.	21997	
		ea.	21991	
		ea.	22010	



Backed by a 1-year warranty, the new Restek Leak Detector sets an industry standard for performance and affordability in hand-held leak detectors.

Leak Detector Facts

Detectable gases:	helium, nitrogen, argon, carbon dioxide, hydrogen
Battery:	Rechargeable Ni-MH internal battery pack (6 hours normal operation)
Operating Temperature Range:	32°-120°F (0°-48°C)
Humidity Range:	0-97%
Warranty:	one year
Certifications:	CE, Ex, Japan
Compliance:	WEEE, RoHS

Description	qty.	cat.#	price
Leak Detector with Hard-Sided Carrying Case and Universal Charger Set (US, UK, European, Australian)	ea.	22839	
Leak Detector Routine Maintenance Review**	ea.	22839-R	
Soft-Side Storage Case	ea.	22657	
Small Probe Adaptor	ea.	22658	

*Caution: The Restek Electronic Leak Detector is designed 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. The Restek Electronic Leak Detector may be used for determining trace amounts of hydrogen in a GC environment only.
 **Routine maintenance includes inspection of the probe tip, internal/external tubing and a battery replacement.



i tech tip

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

for more info

See **page 273** for more information on the Restek Electronic Leak Detector.



Dimensions: 9 1/4" x 2" (23.5 x 5.1 cm)



22081

High-Capacity Indicating Oxygen Trap

- Indicator changes from dark blue to black as oxygen & water are trapped.
- Lasts longer than three smaller traps.
- Use with all carrier gases.
- Ambient operating temperature, 100 psi (689 kPa) operating pressure.
- Built-in frit traps microparticles.
- Outlet gas purity:
 - $O_2 < 0.1$ ppm when inlet does not exceed 15 ppm.
 - $H_2O < 0.5$ ppm when inlet does not exceed 10 ppm.
- Maximum operating pressure: 150 psi (1,034 kPa).
- Maximum flow: 16.5 L/min.

Description	Fittings	qty.	cat.#	price
High-Capacity Indicating Oxygen Trap	1/8" Compression Tube Brass	ea.	20624	
High-Capacity Indicating Oxygen Trap	1/4" Compression Tube Brass	ea.	20623	
Replacement Cartridge (fits 1/4" or 1/8" housing)		ea.	20625	
Replacement O-Rings (5 small O-rings and 5 large O-rings)				



Dimensions: 10" x 2"

Indicating Oxygen Trap

- Indicator changes from light green to grey as oxygen is trapped.
- Heavy-walled glass body, protected by polycarbonate sleeve, prevents oxygen & water infusion.
- Prepurged for fast stabilization.
- 100 psi (689 kPa) maximum operating pressure.
- Reduces oxygen to 0.1 ppm.
- 10 μ m frits at inlet and outlet.

Description	Fittings	qty.	cat.#	price
Indicating Oxygen Trap	1/8" Brass	ea.	22010	
Indicating Oxygen Trap	1/4" Brass	ea.	22011	



Dimensions: 11" x 1 1/2" (27.9 x 3.8 cm)

High-Capacity Oxygen Trap

- Removes up to 600 mg of oxygen or 2 g of water.
- Long life—typically purifies more than five 200 ft³ cylinders.
- Reduces oxygen to 15 ppb.
- Maximum operating pressure: 250 psi (1,724 kPa).
- Flow: 3 L/min. @ 32 psi (221 kPa).

Description	Fittings	qty.	cat.#	price
High-Capacity Oxygen Trap	1/8" Nickel-Plated Brass	ea.	20601	
High-Capacity Oxygen Trap	1/4" Nickel-Plated Brass	ea.	20600	

Rechargeable Molecular Sieve S-Trap

- Traps water vapor; increases column and oxygen trap lifetime.
- Reduces baseline noise from sensitive detectors such as ECDs and mass spectrometers.
- Activated and ready to use.
- Reduces water to less than 1 ppm.
- Fits in GC oven for easy thermal recharging.
- Maximum flow: 1 L/min.



Dimensions:
6 3/4" x 5 5/8" (17.1 x 14.3 cm)

Description	Fittings	qty.	cat.#	price
Rechargeable Molecular Sieve S-Trap	1/8" Brass	ea.	20686	
Rechargeable Molecular Sieve S-Trap	1/4" Brass	ea.	20685	



Dimensions: 11" x 1 1/2" (27.9 x 3.8 cm)

High-Capacity Moisture Trap

- Purged with ultra-high-purity helium; ready to use.
- Reduces water to less than 15 ppb.

1,724 kPa).

qty.	cat.#	price
ea.	21997	
ea.	20638	



Dimensions: 13" x 2" (33 x 5.1 cm)

Indicating Moisture Trap

- Reduces water to less than 10 ppb; indicator changes from orange to green at 5% relative humidity.
- Prepurged for fast stabilization.
- Reduces noise from high-sensitivity detectors.
- Heavy-walled glass body prevents oxygen & water infusion.
- 10 μ m frit prevents microparticulate damage to needle valves and flow controllers.
- Maximum operating pressure: 100 psi (689 kPa).

Description	Fittings	qty.	cat.#	price
Indicating Moisture Trap	1/8" Brass	ea.	22014	
Indicating Moisture Trap	1/4" Brass	ea.	22015	

Gas Traps



Dimensions: 11" x 1½" (27.9 x 3.8 cm)

Capillary-Grade Hydrocarbon Trap

- Packed with an extremely high surface area, baked coconut shell-based activated carbon.
- Purged with ultra-high purity helium.
- Reduces organics to 0.1 ppm (assuming 100 ppm input).
- Maximum operating pressure: 250 psi (1,724 kPa).

Description	Fittings	qty.	cat.#	price
Capillary-Grade Hydrocarbon Trap	⅛" Nickel-Plated Brass	ea.	21991	
Capillary-Grade Hydrocarbon Trap	¼" Nickel-Plated Brass	ea.	21992	



Dimensions: 9¼" x 2¼" (23.5 x 5.7 cm)

Refillable Hydrocarbon Trap

- Removes trace impurities from carrier gas.
- Reduces organics to 0.1 ppm.
- 60 µm frit prevents gas column damage.
- Good for purge & trap systems.
- Refillable and rechargeable.
- Maximum operating pressure: 250 psi (1,724 kPa).
- Maximum flow: 5 L/min.

Description	Fittings	qty.	cat.#	price
Refillable Hydrocarbon Trap	⅛" Nickel-Plated Brass	ea.	22012	
Refillable Hydrocarbon Trap	¼" Nickel-Plated Brass	ea.	22013	
Carbon Refill (two recharges)		pint	20626	

Hydrocarbon S-Trap

- Removes hydrocarbons and other contaminants.
- Reduces organics to 0.1 ppm (assuming 100 ppm input).
- Each individually activated to ensure maximum efficiency.
- Fits in GC oven for easy thermal recharging.
- Maximum operating pressure: 60 psi (414 kPa).



Dimensions:
6¾" x 5⅝" (17.1 x 14.3 cm)

Description	Fittings	qty.	cat.#	price
Hydrocarbon S-Trap	⅛" Brass	ea.	22016	



Dimensions: 6" x 1¾" (15.2 x 4.4 cm)

Indicating Hydrocarbon Trap for Air Compressors

- Pass compressed air from an oil-filled air compressor through this trap, to remove oil vapors and mist.
- Indicator changes from pale pink to deep pink.

Description	Fittings	qty.	cat.#	price
Indicating Hydrocarbon Trap for Air Compressors	⅛" Brass	ea.	20637	
Indicating Hydrocarbon Trap for Air Compressors	¼" Brass	ea.	20636	



Dimensions: 6" x 1" (15.2 x 2.5 cm)

High-Capacity Split Vent Trap

Removes hazardous materials from the capillary vent into the lab.

qty.	cat.#	price
ea.	20698	
5-pk.	20699	



Dimensions: 6" x 1" (15.2 x 2.5 cm)

ECD Vent Trap

- Reduces the release of hazardous materials from the ECD vent into the lab.
- Includes connecting lines and mounting kit.

Description	Fittings	qty.	cat.#	price
ECD Vent Trap	⅛"	ea.	22017	



Carrier Gas Purity

Carrier gas should contain less than 1 ppm of oxygen, moisture, or other trace contaminants, to prevent column degradation, increase column lifetime, and decrease stationary phase bleed.

The expense of using high-purity gases in combination with carrier gas line purifiers will be offset by longer column lifetime and less GC maintenance.

SUPPLIES & ACCESSORIES

Restek Super-Clean Gas Filters

- High-purity output ensures 99.9999% pure gas (at max. flow of 2 L/min.).
- “Quick connect” fittings for easy, leak-tight cartridge changes.
- Glass inside to prevent diffusion; polycarbonate housing outside for safety.
- All traps measure 10⁵/₈" x 1³/₄" (27 x 4.4 cm).
- Each base plate unit measures 4" x 4" x 1⁷/₈" (10.2 x 10.2 x 4.8 cm).

Table I Each Super-Clean gas filter provides high-purity outlet gas.

Type of Filter	Outlet Gas Quality (%)	Maximum Pressure/ Maximum Flow Rates	Use for:	Indicator Color Change	Capacity			Estimated Lifetime (years)
					H ₂ O (g)	O ₂ (mL)	Hydrocarbons (g)	
Moisture cat.# 22028	> 99.9999	11 bar 159 psi/ 7 L/min.	Inert carrier gas Air Hydrogen	Yellow/orange to clear	7.2	—	—	> 2
Oxygen cat.# 22029	> 99.9999	11 bar 159 psi/ 7 L/min.	Inert carrier gas	Green to grey	NA	1,000	—	> 2
Hydrocarbons cat.# 22030	> 99.9999	11 bar 159 psi/ 7 L/min.	Inert carrier gas Air Hydrogen	No indicator	NA	—	12 ¹	> 2
Fuel Gas ¹ cat.# 22022	> 99.9999	11 bar 159 psi/ 7 L/min.	Inert carrier gas Air Hydrogen	Yellow/orange to clear	3.5	—	24 ³	> 1.5
Triple ² cat.# 22020	> 99.9999	11 bar 159 psi/ 7 L/min.	Inert carrier gas	Yellow/orange to clear Green to grey	1.8	500	4 ³	> 1
Helium Specific ² cat.# 21982	> 99.9999	11 bar 159 psi/ 7 L/min.						

¹Removes hydrocarbons, moisture.²Removes hydrocarbons, moisture, oxygen.³As *n*-butane.

**Restek Super-Clean Gas Filter Kits and Replacements**

Description	qty.	cat.#	price
Carrier Gas Cleaning Kit			
Includes: mounting base plate, 1/8" inlet/outlet fittings, and oxygen/moisture/hydrocarbon Triple Gas Filter	kit	22019	
Fuel Gas Purification Kit			
Includes: mounting base plate, 1/8" inlet/outlet fittings, and hydrocarbon/moisture Fuel Gas Filter	kit	22021	
Ultra-High Capacity Hydrocarbon Filter	ea.	22030	
Ultra-High Capacity Moisture Filter	ea.	22028	
Ultra-High Capacity Oxygen Filter	ea.	22029	
Replacement Triple Gas Filter (removes oxygen, moisture and hydrocarbons)	ea.	22020	
Replacement Fuel Gas Filter (removes moisture and hydrocarbons)	ea.	22022	
Helium-Specific Carrier Gas Cleaning Kit			
Includes: mounting base plate, 1/8" inlet/outlet fittings, and oxygen/moisture/hydrocarbon Helium-Specific Filter	kit	21983	
Replacement Helium-Specific Gas Filter (removes oxygen, moisture and hydrocarbons)	ea.	21982	
Gas Filter Bundle Kit			
Includes: one Triple Gas Filter (cat.# 22020) and two Fuel Gas Filters (cat.# 22022)	kit	22031	

**Oxygen and Moisture Traps**

Restek highly recommends oxygen and moisture traps for make-up gas when operating sensitive detectors such as electron capture detectors (ECD). The hydrogen reaction gas for sensitive electrolytic conductivity detectors (ELCD) also requires a hydrocarbon trap, to remove trace impurities.



did you
know?

All Restek Super-Clean gas filter cartridges (except hydrocarbon filter cat.# 22030) feature easy-to-read indicators. The indicator code is shown on every trap so there is no confusion about when to replace it.





22026



22025



22027

Restek Filter Base Plates

- Standard base plate fittings are 1/8". To adapt to 1/4", order 1/8" to 1/4" tube-end unions.
- End fittings available in brass or stainless steel.
- Base plates fit all Super-Clean gas filters listed.

Description	qty.	Brass		Stainless Steel	
		cat.#	price	cat.#	price
Filter Base Plate, Single-Position	ea.	22025	\$231	ea. 22344	
Filter Base Plate, 2-Position	ea.	22026	\$425	ea. 22345	
Filter Base Plate, 3-Position	ea.	22027	\$609	ea. 22346	

Restek Super-Clean Gas Trapping System for LC/MS

A Super-Clean quick-change cartridge system efficiently removes hydrocarbons from nitrogen!

- Changing filters is quick and easy.
- Up to 20 L of hydrocarbon-free nitrogen per minute.
- Filters connected in parallel to handle high flows of LC/MS.



20 L of purified nitrogen per minute!

Super-Clean Gas Filters provide high-purity outlet gas

Type of filter:	Hydrocarbon (charcoal)
Max. Flow:	20 L/min.
Outlet Gas Quality %:	99.9999%
Maximum Pressure:	11 bar/159 psi
Estimated Lifetime:	3 to 6 months

Description	qty.	cat.#	price
Super-Clean Gas-Trapping System	ea.	22062	
	2-pk.	22061	

SUPPLIES & ACCESSORIES

Wall Mounting Bracket

Base plates can be mounted using screws and the mounting holes on the base plate, or using this optional wall mounting bracket.

Description	qty.	cat.#	price
Wall Mounting Bracket for Super-Clean Base Plates	ea.	21984	

Replacement O-Rings for Cartridge Base Plates

Pack includes 10 large O-rings and 10 small O-rings.



Description	qty.	cat.#	price
Replacement O-Rings for Cartridge Base Plates	20-pk.	22023	

1/8-Inch to 1/4-Inch Tube-End Unions

To adapt 1/8" Super-Clean base plate fittings to 1/4", use 1/8" to 1/4" tube-end unions.



21833

Description	qty.	Brass		Stainless Steel	
		cat.#	price	cat.#	price
Tube-End Reducer, 1/8" tube to 1/4"	5-pk.	21833	\$31	2-pk. 21933	

Looking for a nitrogen generator for your LC/MS?

Restek offers a full line of Parker LC/MS generators.

See page 307.



Catch the Buzz

Sign up for Restek's e-newsletter, *The Buzz*

www.restek.com/buzz

Restek Click-On Inline Super-Clean Purification Gas Traps

- High-purity output ensures 99.9999% pure gas.
- Click-On fittings for easy, leak-tight cartridge changes; brass or stainless steel, 1/4" or 1/8".
- Helium-Specific Triple Gas Trap is ideal for GC/MS—it contains oxygen, moisture, and hydrocarbon scrubbers in one cartridge.
- Triple Gas Trap is ideal for purifying carrier gas—it contains oxygen, moisture, and hydrocarbon scrubbers in one cartridge.
- Fuel Gas Trap is ideal for purifying flame ionization detector (FID) fuel gases, removing both moisture and hydrocarbons.

Click-On adaptor connectors allow cartridges to be exchanged without introducing oxygen, moisture, and hydrocarbons. Spring-loaded check valves seal when a filter is removed and open only when a new filter has been locked in place.

Filter Type	Gas Quality at Outlet	Maximum Pressure	Maximum Flow (L/min.)	Use For	H ₂ O (g)	Capacity O ₂ (mL)	Hydrocarbons (g) (n-butane)	Estimated Lifetime (years)
Moisture cat.#22467	>99.9999	11 bar 160 psi	25	Inert carrier gas, helium, air, H ₂	15	NA	NA	>3
Oxygen cat.#22468	>99.9999	11 bar 160 psi	25	Inert carrier gas	NA	2,000	NA	>3
Hydrocarbon cat.#22466	>99.9999	11 bar 160 psi	25	Inert carrier gas, helium, air, H ₂	NA	NA	24	>3
Fuel Gas ¹ cat.#22465	>99.9999	11 bar 160 psi	25					
Triple ² cat.#22464	>99.9999	11 bar 160 psi	25					

¹Removes hydrocarbons, moisture.

²Removes hydrocarbons, moisture, oxygen.

SUPPLIES & ACCESSORIES

NOTE: Super-Clean Gas Filters are recommended for purifying noncorrosive gases with low concentrations of contaminants. The maximum concentration of oxygen in the incoming gas stream for oxygen purifiers is 0.5%.

See next page for more Click-On Inline Super-Clean products.

Click-On Traps measure:
8 1/2" x 1 1/4" (21.6 x 3.2 cm)



did you know?

Trap replacement depends on the quality of the incoming gas. Use the double connector and install an indicating cartridge after a trap to indicate when the trap should be replaced.

Restek Click-On Inline Super-Clean Gas Traps and Connector Kits

Description	qty.	cat.#	price
Carrier Gas Purification Kit			
Includes: (2) 1/8" SS connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22456	
Includes: (2) 1/8" brass connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22457	
Includes: (2) 1/4" SS connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22458	
Includes: (2) 1/4" brass connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22459	
Fuel Gas Purification Kit			
Includes: (4) 1/8" SS connectors and (2) hydrocarbon/moisture traps	kit	22460	
Includes: (4) 1/8" brass connectors and (2) hydrocarbon/moisture traps	kit	22461	
Includes: (4) 1/4" SS connectors and (2) hydrocarbon/moisture traps	kit	22462	
Includes: (4) 1/4" brass connectors and (2) hydrocarbon/moisture traps	kit	22463	



i tech tip

To prevent settling of dessicant, mount vertically, not horizontally.



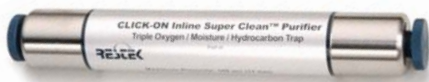
Click-On Inline Super-Clean Indicator

- Oxygen: green to grey
- Moisture: beige to clear

Description	qty.	cat.#	price
Click-On Inline Super-Clean Indicator (oxygen, moisture)	ea.	22474	



Install an indicator after the Click-On inline gas filter so there is no confusion about when to replace the traps.



Click-On Inline Super-Clean Replacement Gas Traps

Description	qty.	cat.#	price
Triple Trap (removes oxygen, moisture and hydrocarbons)	ea.	22464	
Fuel Gas Trap (removes moisture and hydrocarbons)	ea.	22465	

Click-On Inline Super-Clean Connectors

Click-On connectors allow you to change traps quickly, without introducing oxygen into your system.

Each connector is 2³/₈" (6 cm) in length.



Description	Fittings	qty.	cat.#	price
Click-On Inline Super-Clean Connectors	1/8" Brass	2-pk.	22475	
Click-On Inline Super-Clean Connectors	1/8" Stainless Steel	2-pk.	22476	
Click-On Inline Super-Clean Connectors	1/4" Brass	2-pk.	22477	
Click-On Inline Super-Clean Connectors	1/4" Stainless Steel	2-pk.	22478	

Click-On Inline Super-Clean Double Connector

Connects any Click-On trap to a Click-On indicator.

Each double connector is 3" (8 cm) in length.



Description	qty.	cat.#	price
Click-On Inline Super-Clean Double Connector	ea.	22479	\$215

SUPPLIES & ACCESSORIES

Click-On Inline Super-Clean Ultra-High Capacity Gas Traps

Description	qty.	cat.#	price
Ultra-High Capacity Hydrocarbon Trap	ea.	22466	
Ultra-High Capacity Moisture Trap	ea.	22467	
Ultra-High Capacity Oxygen Trap	ea.	22468	

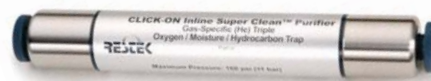
Accessories

for Inline Super-Clean Gas Traps and Connectors

Description	qty.	cat.#	price
Wall-Mounting Clamps for Click-On Inline Super-Clean Gas Traps	4-pk.	22480	
Replacement O-Rings for Click-On Inline Super-Clean Connectors (includes 10 large and 10 small)	20-pk.	22481	

Helium-Specific Click-On Inline Super-Clean Gas Trap and Connector Kits

Description	qty.	cat.#	price
Helium-Specific Carrier Gas Cleaning Kits			
Includes: (2) 1/8" SS connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap	kit	22469	
Includes: (2) 1/8" brass connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap	kit	22470	
Includes: (2) 1/4" SS connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap	kit	22471	
Includes: (2) 1/4" brass connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap	kit	22472	
Replacement Trap			
Helium-Specific Replacement Triple Trap (removes oxygen, moisture and hydrocarbons)	ea.	22473	



did you know?

Helium-Specific Click-On Inline Super-Clean Gas Trap and Kits are designed specifically for purification of helium in GC/MS systems.

VICI® Mat/Sen® Gas-Specific Purifier Modules

- Replace separate oxygen, moisture, and hydrocarbon traps with one multiple-bed purifier, specific for purifying helium, hydrogen, nitrogen, or air.
- Reduce gas impurities from ppm to low ppb levels.
- Decrease baseline noise and increase GC/MS sensitivity.
- Prepurged with the specified gas, to shorten downtime.

Performance for these purifiers is optimized by incorporating a multiple-bed format that progressively lowers concentrations of contaminants at each successive bed. VICI® Mat/Sen® purifiers are guaranteed to produce gases that are purer than 99.9999%, when supplied with gas of 99.995% purity, and are prepurged with the specified gas to speed conditioning. Purifier capacity is approximately four tanks of gas at 99.995% (50 ppm) purity, and correspondingly longer for purer gases.



Dimensions: 21" x 1 1/2"
(53.3 x 3.8 cm)

Please Note: We recommend using an indicating oxygen trap (e.g., cat.# 22029, pg. 225) downstream from a VICI® Mat/Sen® purifier to continually ensure gas purity and indicate absolute change-out time.

Specifications:

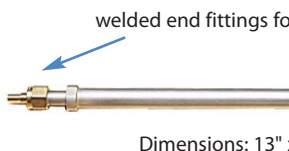
Length	21" (53.3 cm)
Diameter	1.5" (3.8 cm)
Maximum Inlet Pressure	1,000 psi (6895 kPa)
Maximum Recommended Flow	500 mL/min.
Pressure Drop from 120 psi (827 kPa)	
inlet at 0-500mL/min.:	<0.20 psi (1.4 kPa)
End Fittings	compression, 1/8" or 1/4", stainless steel
Shipping Weight	3.04 lb (1.38 kg)

Gas-Specific Purifier Module

Purifier Module	1/4-inch			1/8-inch		
	qty.	cat.#	price	qty.	cat.#	price
Helium Purifier Module	ea.	22600		ea.	22601	
Hydrogen Purifier Module	ea.	22602		ea.	22603	
Nitrogen Purifier Module*	ea.	22604		ea.	22605	
Air Purifier Module	ea.	22606		ea.	22607	

*Warning: Do not use with nitrogen containing more than 500 ppm of oxygen. Use an air purifier.

SUPPLIES & ACCESSORIES



Dimensions: 13"

Thermal Gas High Capacity Purifier Replacement Getter Tube

Each replacement getter tube has 12 L oxygen and 35 L water vapor capacity at a minimum flow rate of 1 liter/minute and removes oxygen, water, carbon monoxide, carbon dioxide, hydrocarbons (except methane) to ppb levels; pure enough for MS. Typically requires replacement once per year.

Change tube when gas pressure drops.

Replacement Getter Tubes	qty.	cat.#	price
1/8" Fittings (Similar to Supelco part# 2-2396)	ea.	21661	
1/4" Fittings (Similar to Supelco part# 2-2398)	ea.	21660	

Replacement getter tubes must be used with a Thermal Gas Purifier housing unit.

Gas Pressure Gauge Kit

- Use an in-line pressure gauge to indicate when a thermal gas purifier getter tube should be replaced.
- Includes 1/8" tee and 0-100 psi (0-689 kPa) gauge.



Description	qty.	cat.#	price
In-line Gas Pressure Gauge Kit for Thermal Gas Purifiers	kit	21657	



Replacement Chemical Traps

- Easy to install.
- Attach to same fittings as original manufacturer's equipment.
- Built-in frits retain fine particles; adsorbents remove both moisture and hydrocarbons.

Description	Similar to Agilent part #	qty.	cat.#	price
Replacement Split Vent Trap for Agilent 6890/6850 GCs	G1544-80550	ea.	22820	
Replacement Chemical Trap for Agilent 5890 GCs	05890-61260	ea.	21610	
Split Vent Line (32-inch) for Agilent GCs				
Includes: all installation hardware	19251-80525	2-pk.	22800	
O-Rings for Agilent Trap Fittings	5180-4181	25-pk.	22064	
Optional Split Vent Trap Assembly for Agilent 6890/6850 GCs	G1544-60610	kit	23031	
Replacement Traps (2) and O-Rings (4)	G1544-80530	kit	23032	



Eliminate ghost peaks—change your chemical trap often!



Parker Balston® PEM Hydrogen Generators

- Proton Exchange Membrane (PEM) cell eliminates the need for liquid electrolytes.
- Reliably generate 99.9995% pure hydrogen—for better chromatography.
- Eliminates high-pressure cylinders—greater convenience and improved lab safety.
- Compact unit, requiring only one square foot of bench space.
- Quick and easy to service and maintain; unique display lighting changes color for easy status checks and water level indication.
- Comes with a set of universal power adapters for US, European, and Asian plug types.



Fuel-grade high purity hydrogen generators are safer alternatives to high-pressure gas cylinders. The new Proton Exchange Membrane (PEM) cell eliminates the use of liquid electrolytes with hydrogen generators. Deionized water is all that is required to generate hydrogen for weeks of continuous operation. With an output capacity of up to 510 cc/minute, one generator can supply 99.9995% pure hydrogen for up to several FIDs. Based on cylinder gas savings alone, a hydrogen generator pays for itself in one or two years.

Produced and supported by an ISO 9001 registered organization, Parker Balston® hydrogen generators are the first built to meet the toughest laboratory standards in the world: CSA, UL, cUL, and CE Mark. A great safety feature.

Specifications

Purity:	99.9995% pure hydrogen
Delivery Pressure:	10-100 psig \pm 1 psig (69-689 kPa \pm 7 kPa)
Outlet Port:	$\frac{1}{8}$ " compression
Electrical Requirements:	100-230 VAC/50-60 Hz
Physical Dimensions:	17.12" h x 13.46" w x 17.95" d 34.19 x 45.6 cm (18 kg) dry

Description

Hydrogen
Hydrogen
Hydrogen
Hydrogen

SUPPLIES & ACCESSORIES

Replacement and Maintenance Components for Hydrogen Generators (for all models listed above)

Replacement Desiccant Cartridge for H2PEM Generators	ea.	23069
6-Month Maintenance Kit for H2PEM Generators		
Includes: 1 deionizer cartridge, 1 water filter, 3 environmental filters	kit	23070
24-Month Maintenance Kit for H2PEM Generators		
Includes: 1 deionizer cartridge, 1 water filter, 3 environmental filters, 1 water level sensor, 1 water pump, and 1 desiccant cartridge	kit	23071

qty.	cat.#	price
ea.	23065	
ea.	23066	
ea.	23067	
ea.	23068	



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literature

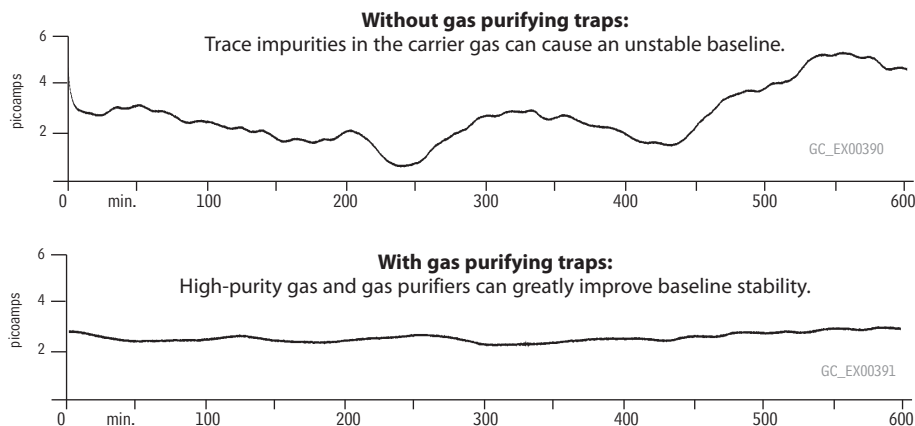
**Parker Balston®
Hydrogen
Generators**

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lit. cat.# 580053A



Using purifying gas
traps in combination
with a gas generator
can improve chro-
matography tremen-
dously and improve
column lifetime.

The combination of high-purity gas and gas purifying traps can save analytical time in the long run.



Parker Balston® Model FID-1000 and FID-2500 Gas Stations

- Single unit produces UHP zero air from house compressed air and 99.9995% pure hydrogen from deionized water.
- Ideal for supplying up to 5-6 FIDs.
- Eliminates inconvenient and dangerous gas cylinders.
- Silent operation, minimal operator attention required.

Parker Balston® Gas Stations provide both UHP grade hydrogen gas and zero grade air for flame ionization detectors. The system is specifically designed to supply gas to FIDs and to support flame thermionic and flame photometric detectors. The units produce zero air by purifying compressed air to a total hydrocarbon concentration of 0.1 ppm or less (measured as methane).

The hydrogen generators produce hydrogen gas from deionized water, using the principle of electrolytic dissociation of water and hydrogen proton conduction through a proton exchange membrane cell.



Produce zero
air and pure
hydrogen from
one unit!

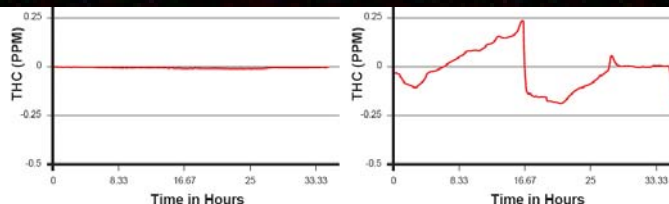
Specifications

Hydrogen Purity:	99.9995%	Power:	120 VAC/amp, 60 Hz, 400 watts
Zero Air Purity:	FID-1000:	Hydrogen Outlet Pressure:	60 psig (414 kPa)
	< 0.1 ppm total hydrocarbons as methane	Zero Air Outlet Pressure:	40-125 psig* (276-862 kPa)
	FID-2500:	Inlet Connection:	1/4" NPT (female)
	< 0.05 ppm total hydrocarbons as methane	Outlet:	1/8" compression
Max. Hydrogen Flow Rate:	FID-1000: 90 cc/min.	Dimensions:	16.5"h x 10.5"w x 17"d
	FID-2500: 250 cc/min		(42 cm x 27 cm x 43 cm)
Max. Zero Air Flow Rate:	FID-1000: 100 cc/min		
	FID-2500: 250 cc/min		

*Zero air inlet requires minimum of 40 psi

SUPPLIES & ACCESSORIES

Compare baselines produced by a Parker Balston® FID Gas Station and bottled fuel air. The baseline produced by the Parker Balston® Generator is flat, with no fluctuations or peaks; the chromatogram from the bottled air fuel supply has many peaks ranging from 0.25 ppm to -0.25 ppm total hydrocarbons.



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FID Gas Stations

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Description	Model #	qty.	cat. #	price
Gas Station	Model FID-1000 (ideal for 1-2 FIDs)	ea.	20177	
Gas Station	Model FID-2500 (ideal for 5-6 FIDs)	ea.	24913	
Replacement Components for FID Gas Stations				
Resin Bed Cartridge for Hydrogen Generators in FID-1000 and FID-2500 Gas Stations		ea.	24914	
Replacement Desiccant Cartridge		ea.	21671	
FID Gas Station Maintenance Kit				
Includes: 1 desiccant cartridge, 1 resin bed cartridge, 1 filter cartridge		ea.	24915	

International Power Cord Sets

Just add the proper suffix to the catalog number for the gas generator you are ordering.

Location	qty.	cat.# suffix	price
United Kingdom (230VAC, 50/50Hz)	ea.	-550	
European (230VAC, 50/60Hz)	ea.	-551	
IEC Connector Only (230VAC, 50/60Hz)	ea.	-552	
Japanese (200VAC, 50/60Hz)	ea.	-556	
Japanese for Zero Air (100VAC, 50/60Hz)	ea.	-553	
Japanese for Hydrogen (100VAC, 50/60Hz)	ea.	-554	
Japanese for Nitrogen (100VAC, 50/60Hz)	ea.	-555	

ordering note

For **international orders**, please add the appropriate power cord suffix from the table below.

Select the power
cord you need.



www.restek.com **305**



21654



Parker Balston® Nitrogen Gas Generators

- Produces ultra-pure nitrogen (up to 99.9995%).
- Flows from 1 to 75+ lpm.
- Require only a compressed air source and 110 volt AC power.
- Typical applications include GC carrier gas, make-up gas, and low flow sample concentrators.
- Maintenance kits include replacement filters.

Specifications

	Model HPN2-1100 or UHPN2-1100	Model HPN2-2000
Maximum Nitrogen Flow Rate:	See Flow Table	2 lpm
Nitrogen Purity:	99.9999%	99.99%
Minimum/Maximum Inlet Pressure:	60 psig/125 psig (414/862kPa)	75 psig/120 psig (517/827kPa)
Electrical Requirements:	120 VAC/60 Hz	120 VAC/60 Hz
Dimensions:	35"h x 12"w x 16"d (89cm x 30cm x 41cm)	35"h x 12"w x 16"d (89cm x 30cm x 41cm)
Shipping Weight:	115 lbs. (52 kg)	115 lbs. (52 kg)

Note:

Models HPN2-1100 and HPN2-2000 do not remove hydrocarbons.

*Power consumption is:

Model HPN2-1100

= 25 Watts

Model UHPN2-1100

= 700 Watts

Model HPN2-2000

= 25 Watts

Flow Table for Models HPN2-2000, HPN2-1100, and UHPN2-1100

Inlet Air Pressure	Maximum Outlet Flow (cc/min.)	Maximum
	Models HPN2-1100 and UHPN2-1100	Outlet Pressure
125 psig (862kPa)	1100	85 psig (586kPa)
110 psig (758kPa)	1000	75 psig (517kPa)
100 psig (689kPa)	900	65 psig (448kPa)
90 psig (620kPa)		
80 psig (551kPa)		
70 psig (482kPa)		
60 psig (414kPa)		
75-120 psig		

SUPPLIES & ACCESSORIES

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Nitrogen Generators

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lit. cat.# 580052

ordering note

For **international orders**, please add the appropriate power cord suffix from the table below.

Nitrogen Generator	Model #	qty.	cat.#	price
Nitrogen Generator	HPN2-2000 (high purity)	ea.	21654	
Nitrogen Generator	HPN2-1100 (ultra-high purity)	ea.	21653	
Nitrogen Generator	HPN2-1100 with European Cord Set	ea.	21653-551	
Nitrogen Generator	HPN2-1100 with IEC Connector Only	ea.	21653-552	
Nitrogen Generator	UHPN2-1100 (ultra-high purity zero grade)	ea.	20697	
Maintenance Kits	Model #	qty.	cat.#	price
Maintenance Kit	for HPN2-1100, HPN2-2000, 76-96, 76-92	kit	21649	
Maintenance Kit	for UHPN2-1100, 76-94	kit	21655	

International Power Cord Sets

Just add the proper suffix to the catalog number for the gas generator you are ordering.

Location	qty.	cat.# suffix	price
United Kingdom (230VAC, 50/50Hz)	ea.	-550	
European (230VAC, 50/60Hz)	ea.	-551	
IEC Connector Only (230VAC, 50/60Hz)	ea.	-552	
Japanese (200VAC, 50/60Hz)	ea.	-556	
Japanese for Zero Air (100VAC, 50/60Hz)	ea.	-553	
Japanese for Hydrogen (100VAC, 50/60Hz)	ea.	-554	
Japanese for Nitrogen (100VAC, 50/60Hz)	ea.	-555	

Select the power cord you need.

Parker Balston® Nitrogen Gas Generators for LC/MS

- Turn compressed air into ultra-pure nitrogen (up to 99.5%).
- Flows from 1 to 44 lpm.
- Models N2-04, N2-14, N2-22, and N2-35 require no electricity.
- Safe, reliable, low maintenance.
- Maintenance kits include replacement filters.



22130



22129



Specifications	NitroFlow Lab	N2-04	N2-14 or N2-14A	N2-22 or N2-22A	N2-35 or N2-35A
Maximum Nitrogen Flow Rate:	32 lpm	8 lpm	78scfh at 95% purity	N2-22: 44 lpm N2-22A: 29 lpm	44 lpm
Nitrogen Purity:	99.50%	99%	95.0%–99.5%	99%	99%
Min/Max Inlet Pressure:	N/A	60 psig/145 psig	60 psig/145 psig	60 psig/145 psig	60 psig/145 psig
Electrical Requirements:	120VAC/60Hz	None	N2-14: None N2-14A: 120VAC/60Hz	N2-22: None N2-22A: 120VAC/60Hz	N2-35: None N2-35A: 120VAC/60Hz
Dimensions:	27.6"h x 35.4"w x 12.2"d (70cm x 90cm x 31cm)	11"h x 13"w x 16"d (27cm x 34cm x 41cm)	50"h x 16"w x 16"d (127cm x 41cm x 41cm)	50"h x 16"w x 16"d (127cm x 41cm x 41cm)	50"h x 16"w x 16"d (127cm x 41cm x 41cm)
Shipping Weight:	205 lbs. (93 kg)	43 lbs. (20 kg)	N2-14: 75 lbs. (34 kg) N2-14A: 80 lbs. (36 kg)	N2-22: 101 lbs. (46 kg) N2-22A: 106 lbs. (48 kg)	N2-35: 115 lbs. (52 kg) N2-35A: 119 lbs. (54 kg)

Nitrogen Generators for LC/MS

Model #
Nitrogen Generator for LC/MS NitroFlow Lab
Nitrogen Generator for LC/MS N2-04 Model
Nitrogen Generator for LC/MS N2-14 (g)
Nitrogen Generator for LC/MS N2-14 w
Nitrogen Generator for LC/MS N2-14A (g)
Nitrogen Generator for LC/MS N2-22 M
Nitrogen Generator for LC/MS N2-22A M
Nitrogen Generator for LC/MS N2-35 Model, 44 lpm max. flow
Nitrogen Generator for LC/MS N2-35A Model, 44 lpm max. flow



Maintenance Kits	Model #	qty.	cat.#	price
Maintenance Kit	for N2-14, N2-14A, 75-72, 75-720NA	kit	21648	
Maintenance Kit with Carbon Filter	for N2-14, N2-14A, 75-72, 75-720NA	ea.	22135	

ordering note

For **international orders**, please add the appropriate power cord suffix from the table on the previous page.

Restek Electronic Leak Detector...

Go to www.restek.com/leakdetector for details.

...and Introducing the NEW Restek ProFLOW 6000 Electronic Flowmeter

Go to www.restek.com/flowmeter for details.



www.restek.com 307



Parker Balston® Zero Air Generators

- Turn in-house compressed air into ultra-pure air (<0.1 ppm total hydrocarbons).
- Remove hydrocarbons to less than 0.1 ppm by catalytic oxidation.
- Operate at 40 to 125 psi (276-862 kPa).
- Typical payback is less than one year, based on cylinder costs.
- Install easily and take up little bench space.
- Maintenance kits include a one year supply of prefilters and final filter.



CE

Specifications

Maximum Zero Air Flow Rate:	75-83NA	1 lpm
	HPZA-3500	3.5 lpm
	HPZA-7000	7 lpm
	HPZA-18000	18 lpm
	HPZA-30000	30 lpm
Outlet Hydrocarbon Concentration (as methane):	75-83NA	< 0.1 ppm
	HPZA-30000	< 0.1 ppm
	Other Models	< .05 ppm
Minimum/Maximum Inlet Air Pressure:	40 psig/125 psig (276/862 kPa)	
Maximum Inlet Hydrocarbon Concentration (as methane):	100 ppm	
Pressure Drop at Maximum Flow Rate:	4 psi (28 kPa) differential	
Maximum Inlet Air Temperature:	78°F (25°C)	

Model	Number of FIDs*
75-83NA	Up to 3
HPZA-3500	Up to 11
HPZA-7000	Up to 23
HPZA-18000	Up to 60
HPZA-30000	Up to 100

*based on a 300 cc/min. fuel air rate

Inlet/Outlet Air Flow:	100 cc/min to 1000 cc/min
Start-up Time:	10 minutes
Electrical Requirements:	120VAC, 50/60Hz
Dimensions:	10 cm x 25 cm x 8 cm
Shipping Dimensions:	12 cm x 27 cm x 3 cm

SUPPLIES & ACCESSORIES

Zero Air Generator	Model #	Capacity	qty.	cat. #	price
Zero Air Generator	75-83NA	1000cc/min.	ea.	20684	
Zero Air Generator	75-83NA with United Kingdom Power Cord	1000cc/min.	ea.	20684-550	
Zero Air Generator	HPZA-3500	3500cc/min.	ea.	20680	
Zero Air Generator	HPZA-3500 with European Power Cord	3500cc/min.	ea.	20680-551	
Zero Air Generator	HPZA-7000	7000cc/min.	ea.	20681	
Zero Air Generator	HPZA-18000	18,000cc/min.	ea.	20682	
Zero Air Generator	HPZA-30000	30,000cc/min.	ea.	20683	

Maintenance Kits (includes a one-year supply of prefilters and final filter)	qty.	cat. #	price
Maintenance Kit for 75-83NA	kit	21646	
Maintenance Kit for HPZA-3500, HPZA-7000, HPZA-18000, HPZA-30000	kit	21647	

Replacement Catalyst Towers	Model #	Capacity	qty.	cat. #	price
Replacement Catalyst Tower	for 75-83NA	1000cc/min.	ea.	22005	
Replacement Catalyst Tower	for HPZA-3500	3500cc/min.	ea.	22004	
Replacement Catalyst Tower	for HPZA-7000	7000cc/min.	ea.	22006	
Replacement Catalyst Tower	for HPZA-18000	18,000cc/min.	ea.	22007	
Replacement Catalyst Tower	for HPZA-30000	30,000cc/min.	ea.	22008	

International Power Cord Sets

Just add the proper suffix to the catalog number for the gas generator you are ordering.

Location	qty.	cat. # suffix	price
United Kingdom (230VAC, 50/50Hz)	ea.	-550	
European (230VAC, 50/60Hz)	ea.	-551	
IEC Connector Only (230VAC, 50/60Hz)	ea.	-552	
Japanese (200VAC, 50/60Hz)	ea.	-556	
Japanese for Zero Air (100VAC, 50/60Hz)	ea.	-553	
Japanese for Hydrogen (100VAC, 50/60Hz)	ea.	-554	
Japanese for Nitrogen (100VAC, 50/60Hz)	ea.	-555	

ordering note

For **international orders**, please add the appropriate power cord suffix from the table below.



free literature

Zero Air Generators

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lit. cat.# 580050

Silcosteel® Regulators

Single and dual stage regulators are now available with Silcosteel® surface treatment. This proprietary passivation process, developed by SilcoTek™, provides excellent inertness for sulfur and mercury calibration standards and improved corrosion resistance over bare 316L stainless steel or other more expensive alloys.

Silcosteel® treated sampling and transfer systems allow oil and gas exploration, chemical and petrochemical plants, and refineries to obtain accurate sulfur and mercury data the first time, every time, with no delay, sample errors, or false readings, down to part-per-billion (ppb) levels. Analysts charged with monitoring sulfur and mercury levels in process streams can save thousands of dollars in improved yields, better test cycle times, and improved system reliability.

Applications:

- CEM Continuous Emission Monitoring
- Environmental Stack and Gas Emission Standards
- Low level sulfur and mercury analysis
- Reactive or corrosive gases
- Off-shore platform systems
- Corrosive and salt water exposure

Outlet pressure:	0 to 100 psig
Outlet gauge:	30" – 0 to 200 psig
Inlet gauge:	0 to 4000 psig
Outlet assembly:	diaphragm valve, 1/4" tube fitting

Description**Single-Stage Regulator**CGA 330 (H₂S and other reduced sulfurs)CGA 350 (H₂, P₂)CGA 660 (NO, NO₂, SO₂)**Dual-Stage Regulator**CGA 330 (H₂S and other reduced sulfurs)CGA 350 (H₂, P₂)CGA 660 (NO, NO₂, SO₂)

ea. 21360-12

For other CGA fittings, please contact your local Restek representative.



SUPPLIES & ACCESSORIES



also available

Regulators for use
with gas standards.
See **pages 433-434**.



Overview of Restek's Ultra-High Purity (UHP) Gas Regulators

- Regulators feature metal-to-metal seals throughout for long-term leak-tightness.
- Metal diaphragm outlet valve ensures gas purity.
- Each regulator is helium leak-test-certifiable to 1×10^{-8} scc/sec.
- Temperature range: -40 °C to 60 °C

Ultra-High Purity (UHP) Brass Body Gas Regulators

UHP brass regulators are the best choice when using ultra-high purity carrier gas for sensitive GC applications using MS, PID, or ECD detection methods. They feature reduced internal dead-volume, relative to stainless steel bodies. The metal valve diaphragm ensures leak-free shut-off. Oxidation-resistant chrome plating maintains a like-new appearance.

Dual-Stage Ultra-High Purity Chrome-Plated Brass Gas Regulators

- Oxidation-resistant, chrome-plated.
- Most stable outlet pressure control.
- Secondary pressure regulation not needed.
- Most widely used regulator.
- Less internal volume than stainless steel gas regulators.

Inlet gauge: 0 to 4,000psig (0-27,579kPa)
 Outlet assembly: diaphragm valve, 1/4" tube fitting

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
CGA 580 (N ₂ , He, Ar)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	21667	
CGA 350 (H ₂ , P ₂)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	21668	
CGA 590 (Air)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	21669	



Inlet gauge: 0 to 4,000psig (0-27,579kPa)
 Outlet assembly: diaphragm valve, 1/4" tube fitting

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
CGA 580 (N ₂ , He, Ar)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	20646	
CGA 350 (H ₂ , P ₂)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	20647	
CGA 590 (Air)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	20648	

Ultra-High Purity Chrome-Plated Brass Line Gas Regulator

- Oxidation-resistant, chrome-plated.
- Use where you need to reduce the line pressure by 20 psig (138 kPa) or more.
- Same purity protection as high-pressure cylinder regulators.

Inlet connections: 1/4" FPT
 Outlet assembly: 1/4" FPT port

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
1/4" female NPT ports*	0-50psig (0-345kPa)	30" - 0 to 100psig (0-689kPa)	ea.	21666	
1/4" female NPT ports*	0-100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	22452	

*Order appropriate male connector, pipe-to-tube fittings.

Swagelok® Male Connector, Pipe-to-Tube Fittings

Fitting Type	Size (inches)	Similar to Swagelok	Brass			Stainless Steel		
			qty.	cat.#	price	qty.	cat.#	price
Male Connector	1/4" to 1/2" NPT	400-1-4	10-pk.	23134	\$44	2-pk.	23184	
Male Connector	1/8" to 1/4" NPT	200-1-4	10-pk.	23136	\$50	2-pk.	23186	
Tube End Reducer	1/4" to 1/8"	200-R-4	5-pk.	23129	\$29	2-pk.	23179	



23134



23179

Ultra-High Purity (UHP) Stainless Steel Body Gas Regulators

UHP stainless steel regulators are the standard for ultra-high-purity and corrosion-resistant pressure regulation. They are more easily purged of atmospheric components, compared to brass gas regulators, making them ideal for the most demanding applications. Stainless steel is especially useful in atmospheres of dry corrosive gases such as hydrogen.

Dual-Stage Ultra-High Purity Stainless Steel Gas Regulators

- Most stable outlet pressure control.
- Secondary pressure regulation not needed.

Inlet gauge: 0 to 4,000psig (0-27,579kPa)
 Outlet assembly: diaphragm valve, 1/4" tube fitting

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
CGA 580 (N ₂ , He, Ar)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20662	
CGA 350 (H ₂ , P ₂)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20663	
CGA 590 (Air)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20664	



Single-Stage Ultra-High Purity Stainless Steel Gas Regulators

- Use when there is secondary pressure regulation downstream.
- Identical gas purity protection as with dual-stage gas regulators.

Inlet gauge: 0 to 4,000psig (0-27,579kPa)
 Outlet assembly: diaphragm valve, 1/4" tube fitting

Fitting	Outlet Pressure
CGA 580 (N ₂ , He, Ar)	0 to 100psig (0-689kPa)
CGA 350 (H ₂ , P ₂)	0 to 100psig (0-689kPa)
CGA 590 (Air)	0 to 100psig (0-689kPa)



Flexible Stainless Steel Hose

Description	Length	Qty.	cat.#	price
Flexible Stainless Steel Hose	36"	1/4" Female NPT	ea.	21332
Flexible Stainless Steel Hose	18"	1/4" Female NPT	ea.	21340
Flexible Stainless Steel Hose	36"	Stainless Steel CGA 580	ea.	21344

SUPPLIES & ACCESSORIES

Flammable Gas Flash Arrestor—Factory Mutual Approved*

- Gas flow shuts off in the event of a flashback.
- Flame extinguished—flame front prevented from reaching the gas supply.
- No gas flow restriction under normal operating conditions.

Description	qty.	cat.#	price
Flammable Gas Flash Arrestor, Brass Body	ea.	21334	

*Approved for brass body servicing hydrogen, acetylene, propane, or natural gas only.



21334

CGA Fittings

CGA-specified nuts and nipples with internal frit, 1/4-inch NPT nickel-plated brass.

Description	qty.	cat.#	price
CGA 580 Fitting, (N ₂ , He, Ar)	ea.	21336	
CGA 350 Fitting, (H ₂ , P ₂)	ea.	21337	
CGA 590 Fitting, (Air)	ea.	21338	



21336

ordering note

International Fittings

All gas regulators are available with the following BS (British Standard) and DIN (German Industrial Standards Organization) connections. Please contact your local Restek representative for more information.

BS 341 #01	BS 341 #08	BS 341 #15	DIN 477 #06	DIN 477 #10	DIN 477 #14
BS 341 #02	BS 341 #10	DIN 477 #01	DIN 477 #07	DIN 477 #11	DIN 477 #15
BS 341 #03	BS 341 #13	DIN 477 #03	DIN 477 #08	DIN 477 #12	
BS 341 #04	BS 341 #14	DIN 477 #05	DIN 477 #09	DIN 477 #13	

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Critical Purity Automatic Switchover System for Noncorrosive Gases

High-purity automatic switchover systems provide a continuous supply of high purity gas to the laboratory, process, or instrument, to allow you to replace a depleted gas source without interruption in the gas supply. Continuous gas supply is achieved by setting the two regulators at slightly different pressures and discharging one side of the system at a time. These models include flexible, all-stainless-steel pigtailed with armor casing. The CGA connection on each pigtail has a check valve in the gland to prevent contamination and minimize purging requirements.



Switching pressure: 200psig/170psig (1379/1172kPa)
 Inlet connections: flexible SS pigtailed (36")
 Line regulator: 0 to 100psig (0-689kPa)

Brass Automatic Switchover System with Line Regulator

	qty.	cat.#	price
CGA 580 (N ₂ , He, Ar)	ea.	20668580	
CGA 350 (H ₂ , P ₂)	ea.	20668350	
CGA 590 (Air)	ea.	20668500	

Stainless Steel Automatic Switchover System with Line Regulator

CGA 580 (N₂, He, Ar)

Protocol Station

The protocol station is designed for convenient wall mounting of high-purity gas regulators. Wall mounting provides ease of use, prevents gas regulator damage, and improves safety. Either chrome-plated brass or 316 stainless steel option is complete with a 3-foot, flexible, all-stainless-steel pigtail with armor casing. The CGA connection on the pigtail has an integral check valve in the gland to prevent contamination during cylinder changeout.



Chrome-Plated Brass Protocol Station*

	qty.	cat.#	price
CGA 580 (N ₂ , He, Ar)	ea.	21347	
CGA 350 (H ₂ , P ₂)	ea.	21348	
CGA 590 (Air)	ea.	21349	

Stainless Steel Protocol Station*

	qty.	cat.#	price
CGA 580 (N ₂ , He, Ar)	ea.	21327	

*Pressure regulator not included. Order separately.



Cylinder Valve Wrench

This specially-designed wrench enables easy opening of cylinder valves that are fitted with a hand wheel. It is also suitable for removing difficult cylinder caps.

Description	qty.	cat.#	price
Cylinder Valve Wrench	ea.	21321	



Universal Cylinder Wrench

Use this versatile wrench for tightening gauges and gas regulator CGA fittings to cylinder outlets and pipe thread connections.

Description	qty.	cat.#	price
Universal Cylinder Wrench	ea.	21322	



Backpressure Gas Regulator

Capillary GC inlet systems have backpressure regulators to maintain a constant upstream pressure and rapidly respond to catastrophic leaks. The 0–60 psig (0–414 kPa) operating range is sufficient to operate a 105 m, 0.25 mm ID column at its optimum flow rate.

	qty.	cat.#	price
	ea.	20635	



MINICYL Regulator. It is constructed of lightweight aluminum with an elastomer diaphragm. Includes a 0–60 psig (0–414 kPa) gauge and either 1/8- or 1/4-inch tube fittings.



Description	Fittings	qty.	cat.#	price
MINICYL Regulator	1/8" Fittings	ea.	20610	
MINICYL Regulator	1/4" Fittings	ea.	20611	



Cylinder Holders, Wall Mounted

Prevent serious injuries! These holders are designed to prevent free-standing gas cylinders from tipping over and injuring personnel. The cast aluminum holder can be secured to a wall or the side of a work bench. Each mount will secure a cylinder 4–15 inches in diameter.

Description	Size	qty.	cat.#	price
Cylinder Holder, Wall Mounted	Single	ea.	21333	
Cylinder Holder, Wall Mounted	Double	ea.	23400	
Cylinder Holder, Wall Mounted	Triple	ea.	23401	
Cylinder Holder, Wall Mounted	Four	ea.	23402	

Swagelok® Fitting Kits (Brass & Stainless Steel)

Save more than 40% by purchasing a new Restek Swagelok® Fittings Kit, compared to prices for the individual parts!

- Includes the most common assortment of 1/8" and 1/4" brass or stainless steel fittings.
- Parts list makes reordering easy.
- Parts come in sturdy tool box for easy and convenient storage.



40%
savings

**Swagelok #, Description, qty included in kit**

B-202-1	1/8" brass nut (20)
B-402-1	1/4" brass nut (20)
B-203-1	1/8" brass front ferrule (20)
B-403-1	1/4" brass front ferrule (20)
B-204-1	1/8" brass back ferrule (20)
B-404-1	1/4" brass back ferrule (20)
B-200-C	1/8" brass cap (6)
B-400-C	1/4" brass cap (6)
B-200-P	1/8" brass plug (6)
B-400-P	1/4" brass plug (6)
B-200-6	1/8" brass union (2)
B-400-6	1/4" brass union (2)
B-400-6-2	1/8" to 1/4" brass reducing union (2)
B-200-3	1/8" brass tee (2)
B-400-3	1/4" brass tee (2)
B-400-R-2	1/8" to 1/4" brass tube end reducer (2)
B-200-R-4	1/8" to 1/2" brass tube end reducer (2)
MS-IG-200	1/8" inspection gauge (1)
MS-IG-400	1/4" inspection gauge (1)

Swagelok #, Description, qty included in kit

SS-200-6	1/8" SS union (2)
SS-400-6	1/4" SS union (2)
SS-400-6-2	1/8" to 1/4" SS reducing union (2)
SS-200-3	1/8" SS tee (2)
SS-400-3	1/4" SS tee (2)
SS-400-R-2	1/8" to 1/4" SS tube end reducer (2)
SS-200-R-4	1/8" to 1/2" SS tube end reducer (2)
MS-IG-200	1/8" inspection gauge (1)
MS-IG-400	1/4" inspection gauge (1)

SUPPLIES & ACCESSORIES

Description	qty.	cat.#	price
Swagelok Fitting Kit, Brass	kit	23141	

Description	qty.	cat.#	price
Swagelok Fitting Kit, Stainless Steel	kit	23197	

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Sign up for our widely acclaimed seminars today!

Visit www.restek.com/seminars

Swagelok® Fittings (Brass & Stainless Steel)

Restek is pleased to offer one of the premier lines of fittings available for chromatographers in the market today. We can supply the entire line of Swagelok® fittings. If you don't see the exact product you're looking for, please call us for a quote.



nut



front ferrule



back ferrule



nut & ferrule set



plug



reducing union



tee



cross



tube end reducer



port connector



male connector



female connector



male quick coupling



female quick coupling

Fitting Type	Size	Swagelok #	qty.	Brass		316 Grade Stainless Steel		
				cat.#	price	qty.	cat.#	price
Nut	1/16"	102-1	20-pk.	23100		5-pk.	23150	
	1/8"	202-1	40-pk.	23101		10-pk.	23151	
	1/4"	402-1	40-pk.	23102		10-pk.	23152	
Front Ferrule	1/16"	103-1	20-pk.	23103		10-pk.	23153	
	1/8"	203-1	40-pk.	23104		20-pk.	23154	
	1/4"	403-1	40-pk.	23105		20-pk.	23155	
Back Ferrule	1/16"	104-1	20-pk.	23106		10-pk.	23156	
	1/8"	204-1	40-pk.	23107		20-pk.	23157	
	1/4"	404-1	40-pk.	23108		20-pk.	23158	
Nut & Ferrule Set	1/16"		10-pk.	23109		2-pk.	23159	
	1/8"		20-pk.	23110		5-pk.	23160	
	1/4"		20-pk.	23111		5-pk.	23161	
Plug	1/16"	100-P	5-pk.	23112		2-pk.	23162	
	1/8"	200-P	10-pk.	23113		4-pk.	23163	
	1/4"	400-P	10-pk.	23114		4-pk.	23164	
Union	1/16"	100-6	3-pk.	23115		ea.	23165	
	1/8"	200-6	5-pk.	23116		2-pk.	23166	
	1/4"	400-6	5-pk.	23117		2-pk.	23167	
Port Connector	1/4" to 1/16"	100-R-4	5-pk.	23127		ea.	23168	
	1/8" to 1/4"	400-R-2	5-pk.	23128		2-pk.	23169	
	1/4" to 1/8"	200-R-4	5-pk.	23129		2-pk.	23170	
Male Connector	1/8"	201-PC	5-pk.	23130		ea.	23171	
	1/4"	401-PC	10-pk.	23131		ea.	23172	
	1/8" to 1/4"	401-PC-2	5-pk.	23132		ea.	23173	
Female Connector	1/8" to 1/8" NPT	200-1-2	10-pk.	23133		ea.	23174	
	1/4" to 1/4" NPT	400-1-4	10-pk.	23134		ea.	23175	
	1/16" to 1/8" NPT	100-1-2	5-pk.	23135		2-pk.	23176	
Male & Female Quick Couplings	1/8" to 1/4" NPT	200-1-4	10-pk.	23136		2-pk.	23177	
	1/4" to 1/8" NPT	400-1-2	10-pk.	23137		2-pk.	23178	
	1/8" to 1/8" NPT	200-7-2	5-pk.	23138		2-pk.	23179	
Male Connector	1/4" to 1/4" NPT	400-7-4	5-pk.	23139		2-pk.	23180	
	1/4" to 1/8" NPT	400-7-2	5-pk.	23140		2-pk.	23181	
	1/8" male*	QC4D-200	—	—		2-pk.	23182	
Female Connector	1/8" male	QC4S-200	—	—		2-pk.	23183	
	1/8" female*	QC4B-200	—	—		2-pk.	23184	
	1/4" male*	QC4D-400	—	—		2-pk.	23185	
Male & Female Quick Couplings	1/4" male	QC4S-400	—	—		2-pk.	23186	
	1/4" female*	QC4B-400	—	—		2-pk.	23187	
	1/8" male*	QC4D-200	—	—		2-pk.	23188	
Female Connector	1/8" male	QC4S-200	—	—		2-pk.	23189	
	1/8" female*	QC4B-200	—	—		2-pk.	23190	
	1/4" male*	QC4D-400	—	—		2-pk.	23191	
Male & Female Quick Couplings	1/4" male	QC4S-400	—	—		2-pk.	23192	
	1/4" female*	QC4B-400	—	—		2-pk.	23193	
	1/8" male*	QC4D-200	—	—		2-pk.	23194	
Female Connector	1/8" male	QC4S-200	—	—		2-pk.	23195	
	1/8" female*	QC4B-200	—	—		2-pk.	23196	
	1/4" male*	QC4D-400	—	—		2-pk.	23197	

*Includes self-sealing shut-off valve.

also available

Restek also carries specialized tools for Swagelok® fittings. See page 325.

Swagelok® Fittings (Siltek®/Sulfinert® & Silcosteel®-CR Treated)

- Full line of treated $1/16$ ", $1/8$ ", and $1/4$ " fittings.
- Silcosteel®-CR treatment enhances corrosion resistance by 10x, or more.
- Custom treatment available for any Swagelok® fitting, or other system parts not listed here (call for details).
- Description of custom Restek coatings listed below.

Fitting Type	Size	Swagelok #	Siltek/Sulfinert Treated			Silcosteel-CR Treated		
			qty.	cat.#	price	qty.	cat.#	price
Union	$1/16$ "	SS-100-6	ea.	22540		ea.	22575	
	$1/8$ "	SS-200-6	ea.	22541		ea.	22576	
	$1/4$ "	SS-400-6	ea.	22542		ea.	22577	
	$3/8$ "	SS-600-6	ea.	22909		ea.	22904	
Tee	$1/16$ "	SS-100-3	ea.	22543		ea.	22578	
	$1/8$ "	SS-200-3	ea.	22544		ea.	22579	
	$1/4$ "	SS-400-3	ea.	22545		ea.	22580	
	$3/8$ "	SS-600-3	ea.	22910		ea.	22905	
Reducing Union	$1/8$ " to $1/16$ "	SS-200-6-1	ea.	22546		ea.	22581	
	$1/4$ " to $1/16$ "	SS-400-6-1	ea.	22547		ea.	22582	
	$1/4$ " to $1/8$ "	SS-400-6-2	ea.	22548		ea.	22583	
	$3/8$ " to $1/4$ "	SS-600-6-4	ea.	22911		ea.	22906	
Elbow	$1/8$ "	SS-200-9	ea.	22549		ea.	22584	
	$1/4$ "	SS-400-9	ea.	22550		ea.	22585	
Plug	$1/8$ "	SS-200-P	ea.	22573		ea.	22620	
	$1/4$ "	SS-400-P	ea.	22574		ea.	22597	
Cross	$1/8$ "	SS-200-4	ea.	22551		ea.	22586	
	$1/4$ "							
Tube End Reducer	$1/8$ " tube to $1/16$ "							
	$1/4$ " tube to $1/16$ "							
	$1/8$ " tube to $1/4$ "							
	$1/4$ " tube to $1/8$ "							
Port Connector	$1/8$ "							
	$1/4$ "							
Male Connector	$1/8$ " to $1/8$ " NPT	SS-200-1-2	ea.	22561		ea.	22595	
	$1/4$ " to $1/4$ " NPT	SS-400-1-4	ea.	22562		ea.	22596	
	$1/16$ " to $1/8$ " NPT	SS-100-1-2	ea.	22563		ea.	22610	
	$1/8$ " to $1/4$ " NPT	SS-200-1-4	ea.	22564		ea.	22611	
	$1/4$ " to $1/8$ " NPT	SS-400-1-2	ea.	22565		ea.	22612	
	$3/8$ " to $3/8$ " NPT	SS-600-1-6	ea.	22912		ea.	22907	
Female Connector	$1/8$ " to $1/8$ " NPT	SS-200-7-2	ea.	22566		ea.	22613	
	$1/4$ " to $1/4$ " NPT	SS-400-7-4	ea.	22567		ea.	22614	
	$1/4$ " to $1/8$ " NPT	SS-400-7-2	ea.	22568		ea.	22615	
	$1/8$ " to $1/4$ " NPT	SS-200-7-4	ea.	22569		ea.	22616	
Bulkhead Union	$1/8$ "	SS-200-61	ea.	22570		ea.	22617	
	$1/4$ "	SS-400-61	ea.	22571	\$68	ea.	22618	



union



tee



reducing union



elbow



cross



port connector



male connector



female connector



bulkhead union

SUPPLIES & ACCESSORIES

Custom Restek Coatings

- **Siltek®**—The ultimate passivation of treated surfaces, from glass to high nickel alloys of steel; ideal for sulfurs, automotive exhaust testing, or stack gas sampling.
- **Sulfinert®**—A required treatment for metal components when analyzing for parts-per-billion levels of organo-sulfur compounds.
- **Silcosteel®-CR**—A corrosion resistant layer that increases the lifetime of system components in acidic environments containing hydrochloric acid, nitric acid, or seawater.

For more information on our custom coatings, see page 318.

Parker® Fittings (Brass & Stainless Steel)

Parker's (A-Lok®) two-piece ferrules and NPT fittings are ideal for installing new equipment, modifying existing instrumentation, or replacing worn connections. Restek offers both brass and stainless steel fittings. If there is a particular Parker® fitting that you are looking for and it is not listed here, please contact us to inquire about availability.



nut



front ferrule



back ferrule



nut & ferrule set



plug



union



reducing union



cross



tube end reducer



port connector



male connector



female connector



male & female quick couplings

Fitting Type	Size	Parker #	qty.	Brass		316 Grade Stainless Steel		
				cat. #	price	qty.	cat. #	price
Nut	1/16"	1 Nu 1	20-pk.	21800		5-pk.	21900	
	1/8"	2 Nu 2	40-pk.	21801		10-pk.	21901	
	1/4"	4 Nu 4	40-pk.	21802		10-pk.	21902	
Front Ferrule	1/16"	1 FF 1	20-pk.	21803		10-pk.	21903	
	1/8"	2 FF 2	40-pk.	21804		20-pk.	21904	
	1/4"	4 FF 4	40-pk.	21805		20-pk.	21905	
Back Ferrule	1/16"	1 BF 1	20-pk.	21806		10-pk.	21906	
	1/8"	2 BF 2	40-pk.	21807		20-pk.	21907	
	1/4"	4 BF 4	40-pk.	21808		20-pk.	21908	
Nut & Ferrule Set	1/16"	—	10-pk.	21809		2-pk.	21909	
	1/8"	—	20-pk.	21810		5-pk.	21910	
	1/4"	—	20-pk.	21811		5-pk.	21911	
Plug	1/16"	1 BLP 1	5-pk.	21815		2-pk.	21915	
	1/8"	2 BLP 2	10-pk.	21816		4-pk.	21916	
	1/4"	4 BLP 4	10-pk.	21817		4-pk.	21917	
Union	1/16"	1 SC 1	3-pk.	21818		ea.	21918	
	1/8"	2 SC 2	5-pk.	21819		2-pk.	21919	
	1/4"	—	—	—		2-pk.	21920	
Tube End Reducer	1/8" tube to 1/16"	2 TUR 1	5-pk.	21831		2-pk.	21931	
	1/4" tube to 1/16"	4 TUR 1	5-pk.	21832		2-pk.	21932	
	1/8" tube to 1/4"	2 TUR 4	5-pk.	21833		2-pk.	21933	
	1/4" tube to 1/8"	4 TUR 2	5-pk.	21834		2-pk.	21934	
Port Connector	1/8"	2 PC 2	5-pk.	21835		2-pk.	21935	
	1/4"	4 PC 4	10-pk.	21836		2-pk.	21936	
	1/8" tube to 1/4"	2 PC 4	5-pk.	21837		2-pk.	21937	
Male Connector	1/8" to 1/8" NPT	2 MSC 2N	10-pk.	21841		2-pk.	21941	
	1/4" to 1/4" NPT	4 MSC 4N	10-pk.	21842		2-pk.	21942	
	1/16" to 1/8" NPT	1 MSC 2N	5-pk.	21843		2-pk.	21943	
	1/8" to 1/4" NPT	2 MSC 4N	10-pk.	21844		2-pk.	21944	
	1/4" to 1/8" NPT	4 MSC 2N	10-pk.	21845		2-pk.	21945	
Female Connector	1/8" to 1/8" NPT	2 FSC 2N	5-pk.	21846		2-pk.	21946	
	1/4" to 1/4" NPT	4 FSC 4N	5-pk.	21847		2-pk.	21947	
	1/4" to 1/8" NPT	4 FSC 2N	5-pk.	21848		2-pk.	21948	
Male & Female Quick Couplings	1/8" male*	2A-Q4VN	—	—		ea.	21957	
	1/8" male	2A-Q4P	—	—		ea.	21958	
	1/8" female*	2A-Q4CN	—	—		ea.	21959	
	1/4" male*	4A-Q4VN	—	—		ea.	21960	
	1/4" male	4A-Q4P	—	—		ea.	21961	
	1/4" female*	4A-Q4CN	—	—		ea.	21962	

*Includes self-sealing shut-off valve.

Parker® Fittings (Siltek®/Sulfinert® Treated & Silcosteel®-CR Treated)

A broad line of 1/16", 1/8" and 1/4" fittings are available with Siltek®/Sulfinert® or Silcosteel®-CR treatment. Because of expanding applications for these coatings, we have received many requests for a broader product offering. If you do not see everything you need, contact us for information on custom coating services.

Fitting Type	Size	Parker #	Siltek/Sulfinert Treated			Silcosteel-CR Treated		
			qty.	cat.#	price	qty.	cat.#	price
Union	1/16"	1 SC 1	ea.	22520		ea.	22863	
	1/8"	2 SC 2	ea.	22521		ea.	22864	
	1/4"	4 SC 4	ea.	22522		ea.	22865	
Tee	1/16"	1 ET 1	ea.	22526		ea.	22866	
	1/8"	2 ET 2	ea.	22527		ea.	22867	
	1/4"	4 ET 4	ea.	22528		ea.	22868	
Reducing Union	1/8" to 1/16"	2 RU 1	ea.	22523		ea.	22869	
	1/4" to 1/16"	4 RU 1	ea.	22524		ea.	22870	
	1/4" to 1/8"	4 RU 2	ea.	22525		ea.	22871	
Elbow	1/4"	2 EE 2	ea.	22530		ea.	22875	
	1/4"	4 EE 4	ea.	22531		ea.	22876	
Plug	1/8"	2 BLP 2	ea.	21540		ea.	22878	
	1/4"	4 BLP 4	ea.	21541		ea.	22879	
Cross	1/8"	2 ECR 2	ea.	21542		ea.	22872	
	1/4"	4 ECR 4	ea.	21543		ea.	22873	
Tube End Reducer	1/8" tube to 1/16"	2 TUR 1	ea.	21544		ea.	22880	
	1/4" tube to 1/16"	4 TUR 1	ea.	21545		ea.	22881	
	1/8" tube to 1/4"							
	1/4" tube to 1/8"							
Port Connector	1/8"							
	1/4"							
Male Connector	1/8" to 1/8" NPT	2 MSC 4N	ea.	21554		ea.	22890	
	1/4" to 1/4" NPT							
	1/16" to 1/8" NPT							
	1/8" to 1/4" NPT							
	1/4" to 1/8" NPT	4 MSC 2N	ea.	21555		ea.	22891	
Female Connector	1/8" to 1/8" NPT	2 FSC 2N	ea.	21556		ea.	22892	
	1/4" to 1/4" NPT	4 FSC 4N	ea.	21557		ea.	22893	
	1/4" to 1/8" NPT	4 FSC 2N	ea.	21558		ea.	22894	
	1/8" to 1/4" NPT	2 FSC 4N	ea.	21559		—	—	
Plug Valve, 2-Way	1/8"	2A PR4 VT SS	ea.	21586		—	—	
	1/4"	4A PR4 VT SS	ea.	21587		—	—	
Ball Valve, 2-Way	1/8"	2A B2LJ2 SSP	ea.	21588		—	—	
	1/4"	4A B2LJ2 SSP	ea.	21589		—	—	

SUPPLIES & ACCESSORIES



union



tee



reducing union



elbow



cross



port connector



male connector



female connector



plug valve, 2-way



ball valve, 2-way

Please note: Nuts and ferrules are not treated unless requested (custom parts). Nuts and ferrules normally are not in contact with sample pathway, and thus do not require coating.

Ball and plug valves are also available in brass and stainless steel. See **page 322**.

Valco® Fittings (Siltek®/Sulfinert® Treated)

Fitting Type	Size	Siltek/Sulfinert Treated		
		qty.	cat.#	price
Zero Dead Volume Tee	1/16"	ea.	22534	
	1/8"	ea.	22535	
Zero Dead Volume Union	1/16"	ea.	22532	
	1/8"	ea.	22533	

zero dead volume
teezero dead volume
union

Tubing



Tubing and Available Coatings

Restek sets the standard in tubing for analytical and process applications. Complete your system with precleaned or treated tubing and treated fittings and valves for an inert, corrosion-resistant pathway.

Available tubing coatings include:

- **Siltek®**—The ultimate passivation of treated surfaces, from glass to high nickel alloys of steel; ideal for sulfurs, automotive exhaust testing or stack gas sampling.
- **Silcosteel®-CR**—A corrosion resistant layer that increases the lifetime of system components in acidic environments containing hydrochloric acid, nitric acid, or seawater.
- **Sulfinert®**—A required treatment for metal components when analyzing for parts-per-billion levels of organo-sulfur compounds.

Frequently Asked Questions

1. Can treated tubing be bent?

Treated tubing can be bent into curves with a bend radius greater than 1 inch for 1/16-inch OD tubing, 2 inches for 1/8-inch OD tubing, or 4 inches for 1/4-inch OD tubing. The treatment layer will remain intact as long as the tubing isn't stretched dramatically. If tight bends are necessary, use a treated elbow union or bend untreated tubing and send it to Restek for custom treatment.

2. Can compression fittings be used without crushing the treatment layer?

Yes. The layer is thin and pliable and can be used with minimal damage.

3. Is welding possible after treatment?

Yes. The coating does not interfere with welding of treated components. The coating is removed from the affected zones approximately 1/16 inch.

4. Is any additional chemical deactivation necessary?

A Sulfinert® or Silcosteel® layer leaves few exposed active sites, so there usually is no need for additional treatment. Chemical deactivation is useful in chromatographic applications in which water will be vaporized on the Silcosteel® treated surface, but is not necessary for Sulfinert® treated surfaces. Parts used in high-temperature applications (>400 °C) cannot be chemically deactivated.

5. What are the temperature constraints of these surface treatments?

On stainless steel, a Silcosteel® layer is stable to 600 °C. Parts treated with a secondary polymeric layer are limited to temperatures of 400 °C in inert atmospheres and 250 °C when oxygen is present, the temperature maximums for the polymer. Temperatures above 600 °C can be used under certain conditions—please contact us for information.

6. Why use Sulfinert® or Silcosteel® treatment instead of Teflon® coating?

Three reasons: 1) Sulfinert® and Silcosteel® layers are nonpolymeric, so they do not exhibit the problems associated with gas permeability. 2) Teflon® coating often flakes off the surface, while the Sulfinert® or Silcosteel® layer is tightly integrated into the substrate lattice. 3) Teflon® coating is limited to 280 °C, while Silcosteel® treated stainless steel tubing and fittings can be used to 600 °C.

7. Why use Siltek®/Sulfinert® treated tubing for transfer lines?

Siltek®/Sulfinert® treated stainless steel tubing offers all of the advantages of glass or fused silica tubing for the transfer of active compounds (e.g., sulfurs), but is far more durable and flexible.

8. Is treated tubing similar to glass-lined tubing (GLT)?

No. Sulfinert® or Silcosteel® treated tubing is flexible and can be bent without heating. Also, the Sulfinert® or Silcosteel® layer is much more durable than GLT.

9. How should I clean a treated part after use?

Use a mild detergent (methylene chloride, acetone, etc.) to clean the part. Mild sonication may be used. Do not use caustic, abrasive, or organic solvents. No damage or dissolve the coating. Exposure to oxygen or air could be avoided.

10. What materials should I avoid using with Silcosteel® treated parts?

The Silcosteel® coating is silicon-based and is prone to attack by hydrofluoric acid or by basic compounds. The surface should not be exposed to media with pH>8.

11. Siltek® and Sulfinert®: What's the Difference?

Siltek® is the name for the patented deposition process. When the Siltek® process was developed, the application that showed the greatest benefit was the storage and transfer of low ppb level active sulfur compounds, such as hydrogen sulfide and mercaptans. Because there was (and continues to be) demand for a reliable surface treatment for this application, the name Sulfinert® is used to describe Siltek® treated products created specifically for this purpose.



Instrument-Grade Welded and Drawn 304 Grade Stainless Steel Tubing

Clean tubing is critical to ensure the delivery of pure gas to your instrument. Restek's stainless steel tubing is cleaned specifically for inertness using the procedure for processing Silcosteel® and Siltek®-treated products, because scrupulously clean parts are a prerequisite for a quality coating. This ensures you are getting quality tubing for your chromatography system.

Tubing Dimensions		Length (per-foot pricing on 26 feet or more)					
		25 Feet		26–100 Feet		> 100 Feet*	
ID (in.)	OD (in.)	cat.#	price	cat.#	price	cat.#	price
0.01"	1/16"	21500	\$67	21501		21502	
0.02"	1/16"	21503	\$67	21504		21505	
0.03"	1/16"	21506	\$67	21507		21508	
0.04"	1/16"	21509	\$67	21510		21511	
0.085"	1/8"	21512	\$60	21513		21514	
0.21"	1/4"	21515	\$72.50	21516		21517	

*The availability of long lengths (continuous lengths up to 500 feet) is subject to inventory constraints. Please inquire before ordering.



ordering note

Required length in meters x 3.2808 = length in feet.

An extra charge is applied for cutting and/or straightening stainless steel and/or copper tubing, calculated from the total number of pieces produced for each line item:

Precleaned Copper Tubing

- Adheres to ASTM B-280.
- Precleaned and ready to use.
- Use for plumbing GC systems.

ID	OD	Wall	qty.	cat.#	price	# of Pieces	Added Charge
0.065"	1/8"					5 to 15	0
0.190"	3/8"						



Plumbing a GC

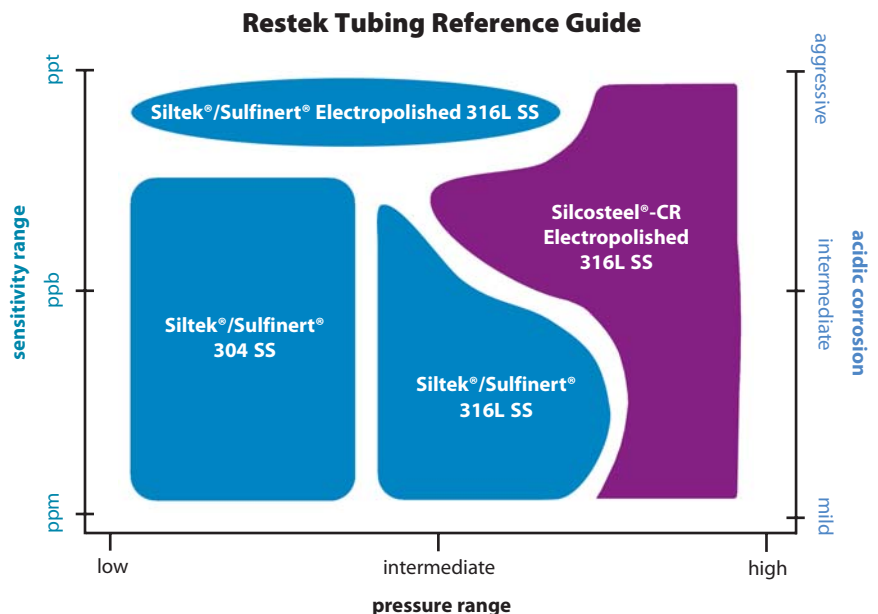
It is essential to use clean chromatography tubing that contains residual hydrocarbon contamination. This contamination can migrate into the carrier gas stream, elevating background noise and causing down time.



frequently asked question

Which treated tubing should I use?

This chart will help you determine the tubing best suited to your application with respect to pressure, sensitivity of your analysis, and acidic environment exposure. For more frequently asked questions on treated tubing, see previous page.



Tubing

did you **know?**

A smoother internal surface is less adsorptive.



Top: electropolished finish, surface roughness average number: 10-15.

Bottom: conventional finish, surface roughness average number: approx. 23-27.

Treated Seamless Electropolished 316L Grade Stainless Steel Tubing

Our highest performing tubing. Recommended for:

- demanding/corrosive environments.
- high temperatures.
- ultimate inertness.

Siltek®/Sulfinert Treated (Coiled)

OD	ID	Wall Thickness	cat.#	Price-per-foot			
				5-24 ft.	25-99 ft.	100-299 ft.	> 300 ft.
1/8" (3.18mm)	0.085" (2.16mm)	0.020"	22538				
1/4" (6.35mm)	0.180" (4.57mm)	0.035"	22539				

Silcosteel®-CR Treated (Coiled)

OD	ID	Wall Thickness	cat.#	Price-per-foot			
				5-24 ft.	25-99 ft.	100-299 ft.	> 300 ft.
1/8" (3.18mm)	0.085" (2.16mm)	0.020"	22536				
1/4" (6.35mm)	0.180" (4.57mm)	0.035"	22537				

1/8" OD: 5 ft. to 95 ft. in one continuous coil; 1/4" OD: 5 ft. to 300 ft. in one continuous coil. Longer lengths will be more than one coil.

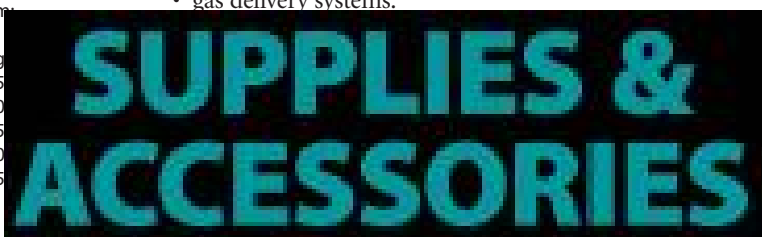
Treated Welded/Drawn 304 Grade Stainless Steel Tubing

Our most popular grade of tubing. Recommended for:

- chromatography applications.
- gas delivery systems.

An extra charge is applied for cutting Siltek®/Sulfinert® or Silcosteel®-CR tubing. The charge is calculated from the total number of pieces produced for each line item.

# of Pieces	Added Charge
5 to 15	\$5
16 to 30	\$10
31 to 75	\$15
76 to 99	\$20
100 to 200	\$25



Price-per-foot			
199 ft.	200-399 ft.	> 400 ft.	

7/16" (1.59mm)	0.020" (0.51mm)		22503				
1/16" (1.59mm)	0.030" (0.76mm)		22504				
1/16" (1.59mm)	0.040" (1.02mm)		22505				
1/8" (3.18mm)	0.085" (2.16mm)	0.020"	22506				
1/4" (6.35mm)	0.210" (5.33mm)	0.020"	22507				

Minimum Bend Radius for Coated Tubing

OD	Min. Bend Radius
≤ 1/16"	1" (2.5 cm)
1/8"	2" (5.1 cm)
1/4"	4" (10.2 cm)
3/8"	6" (15.2 cm)

Treated Seamless 316L Grade Stainless Steel Tubing

High durability tubing. Recommended for:

- inert applications.
- high temperatures.
- high pressures.
- corrosive environments.
- zero bleed.

Siltek®/Sulfinert® Treated (Coiled)

OD	ID	Wall Thickness	cat.#	Price-per-foot			
				5-24 ft.	25-199 ft.	200-399 ft.	> 400 ft.
1/8" (3.18mm)	0.055" (1.40mm)	0.035"	22508				
1/4" (6.35mm)	0.180" (4.57mm)	0.035"	22509				
3/8" (9.52mm)	0.277" (7.04mm)	0.049"	22914				

Silcosteel®-CR Treated (Coiled)

OD	ID	Wall Thickness	cat.#	Price-per-foot			
				5-24 ft.	25-199 ft.	200-399 ft.	> 400 ft.
1/8" (3.18mm)	0.055" (1.40mm)	0.035"	22896				
1/4" (6.35mm)	0.180" (4.57mm)	0.035"	22897				
3/8" (9.52mm)	0.277" (7.04mm)	0.049"	22915				

did you **know?**

Other lengths and diameters of treated tubing are available on a custom basis.

Call for availability of lengths greater than 1,000 ft.

ordering **note**

Required length in meters x 3.2808 = length in feet.

Treated Straight, 6-Foot Length Stainless Steel Tubing

Individual 6-foot ($\pm 1/2$ ") straight pieces.

In response to customer requests, we offer 6-foot straight lengths of $1/8$ -, $1/4$ -, and $3/8$ -inch treated tubing. This tubing can be cut to your exact requirements using a standard tubing cutter.

Siltek®/Sulfinert® Treated, 316L Grade

OD	ID	Wall Thickness	qty.	cat.#	price
$1/8$ " (3.18mm)	0.055" (1.40mm)	0.035"	ea.	22901	
$1/4$ " (6.35mm)	0.180" (4.57mm)	0.035"	ea.	22902	
$3/8$ " (9.52mm)	0.277" (7.04mm)	0.049"	ea.	22903	

Silcosteel®-CR Treated, 316L Grade

OD	ID	Wall Thickness	qty.	cat.#	price
$1/8$ " (3.18mm)	0.055" (1.40mm)	0.035"	ea.	22898	
$1/4$ " (6.35mm)	0.180" (4.57mm)	0.035"	ea.	22899	
$3/8$ " (9.52mm)	0.277" (7.04mm)	0.049"	ea.	22900	

Treated Hydroguard® Deactivated Stainless Steel Tubing

Hydroguard® deactivation creates a high-density surface that is not readily attacked by aggressive hydrolysis.

Silcosteel® Treated, 304 Grade

OD	ID	Wall Thickness	cat.#	price
$1/16$ " (1.59mm)	0.010" (0.25mm)	0.008"	22493	
$1/16$ " (1.59mm)	0.020" (0.51mm)	0.015"	22494	
$1/16$ " (1.59mm)	0.030" (0.76mm)	0.020"	22495	
$1/16$ " (1.59mm)	0.040" (1.02mm)	0.025"	22496	
$1/8$ " (3.18mm)	0.085" (2.16mm)	0.020"	22497	
$1/4$ " (6.35mm)	0.210" (5.33mm)	0.020"	22492	

Silcosteel® Treated, Seamless 316L Grade

OD	ID	Wall Thickness	cat.#	Price-per-foot			
				5-24 ft.	25-199 ft.	200-399 ft.	> 400 ft.
$1/8$ " (3.18mm)	0.055" (1.40mm)	0.035"	22491				
$1/4$ " (6.35mm)	0.180" (4.57mm)	0.035"	22490				

Silcosteel® Treated, Electropolished 316L Grade

OD	ID	Wall Thickness	cat.#	Price-per-foot			
				5-24 ft.	25-99 ft.	100-299 ft.	> 300 ft.
$1/8$ " (3.18mm)	0.085" (2.16mm)	0.020"	22489				
$1/4$ " (6.35mm)	0.180" (4.57mm)	0.035"	22488				

Siltek®/Sulfinert® treated tubing is recommended for purge & trap and headspace systems



An extra charge is applied for cutting Siltek®/Sulfinert®, Silcosteel®, or Silcosteel®-CR tubing. The charge is calculated from the total number of pieces produced for each line item:

# of Pieces	Added Charge
5 to 15	
16 to 30	
31 to 75	
76 to 99	
100 to 200	

Shut-Off Gas Valves
Swagelok®



Toggle valve



Ball valve



Plug valve

	1/8" Brass		1/4" Brass		1/8" Stainless Steel		1/4" Stainless Steel	
Valve Type	cat.#	ea.	cat.#	ea.	cat.#	ea.	cat.#	ea.
Toggle	23142		23143		23198		23199	
Ball	23144		23145		23200		23201	
Plug	23146		23147		23202		23203	



23207



23209



23214



23212



23213



23210



23211



23215

Metering Gas Valves
Swagelok®



23206

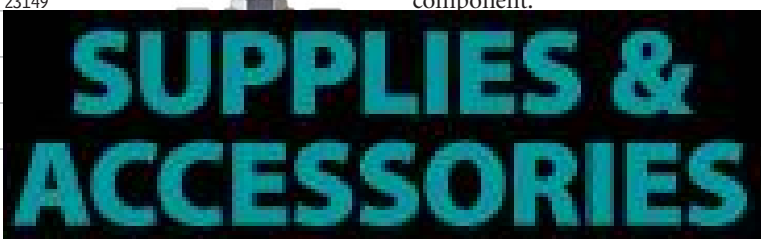
Description	qty.	cat.#	price
1/8" Brass			
Metering Valve, straight	ea.	23148	
1/4" Brass			
Metering Valve, straight	ea.	23149	
1/8" Stainless Steel			
Metering Valve, straight	ea.		
1/4" Stainless Steel			
Metering Valve, straight	ea.		
Vernier Knob for Metering Valve	ea.		

VCO® O-Ring Face Seal Fittings
Swagelok®

- Unique design allows easy installation where space is limited.
- Assemblies can be used from high pressure to critical vacuum, across a wide range of temperatures.
- Smooth finish on gland face ensures positive seal.
- Sealing is accomplished with a captive O-ring in the body component.



ings are designed for rapid
systems.



Shut-Off Gas Valves
Parker Balston®



Toggle valve



Ball valve



Plug valve

	1/8" Brass		1/4" Brass		1/8" Stainless Steel		1/4" Stainless Steel	
Valve Type	cat.#	ea.	cat.#	ea.	cat.#	ea.	cat.#	ea.
Toggle	22188		22189		22190		22191	
Ball	22192		22193		22194		22195	
Plug	22196	\$61	22197		22198		22199	

Parker Balston ball and plug valves are also available treated. See **page 317**.

Specifications:

Pressure Ratings	Up to 15,400 psig (1061 bar)
Temperature Ratings	Up to 400 °F (204 °C)

Description	Material	qty.	cat.#	price
1/4" VCO to 1/4" Tube Adaptor	Stainless Steel	2-pk.	23207	
1/4" VCO to 1/4" Tube Adaptor	Siltek Treated	2-pk.	23209	
1/4" VCO to 1/4" Tube Fitting	Stainless Steel	2-pk.	23210	
1/4" VCO to 1/4" Tube Fitting	Siltek Treated	ea.	23211	
1/4" VCO to 1/8" Tube Fitting	Stainless Steel	2-pk.	23215	
1/4" VCO to 1/8" Tube Fitting	Siltek Treated	ea.	23216	
1/4" VCO Nut	Stainless Steel	2-pk.	23212	
1/4" VCO Nut Blind	Stainless Steel	2-pk.	23213	
1/4" VCO Body Blind	Stainless Steel	2-pk.	23214	
Replacement O-Ring, 70 Durometer Fluorocarbon FKM, VCO 1/4", Size 010		10-pk.	23208	

Gap inspection gauge available on **page 325**.

Metering Gas Valves
Parker Balston®



22209

Description	qty.	cat.#	price
1/4" Nickel-Plated Brass			
Metering, straight	ea.	22200	
1/4" Nickel-Plated Brass			
Metering, straight	ea.	22201	
1/8" Stainless Steel			
Metering, straight	ea.	22204	
1/4" Stainless Steel			
Metering, straight	ea.	22205	
Vernier Knob for Metering Valve	ea.	22209	



22200



21325

GC Installation Kit

This kit contains the tubing and fittings needed to add an additional GC to your lab bench. Kit includes: tubing cutter, one 1/8-inch x 1/4-inch reamer, one 1/4-inch x 1/8-inch brass tube end reducer, one 7/16-inch wrench, one 1/2-inch wrench, four 1/8-inch brass tees, ten 1/8-inch brass nuts, ten brass front and back ferrules, and 50 feet (15.2 meters) of our instrument-grade cleaned 1/8-inch copper tubing.

Description	qty.	cat.#	price
GC Installation Kit	kit	21325	



22998

12 Piece Ball-Point Hex Key Set

Includes 12 hex keys (Allen wrenches): 0.050", 1/16", 5/64", 3/32", 7/64", 1/8", 9/64", 5/32", 3/16", 7/32", 1/4", and 5/16".

Description	qty.	cat.#	price
12 Piece Ball-Point Hex Key Set	set	22998	



23004

54-Piece Tool Kit

Set comes with screwdrivers, pliers, clamps, and more. Durable, zippered case for easy transport.

Description	qty.	cat.#	price
Tool Kit	kit	23004	

Torx® Screwdriver Set

- Set includes TR-10, TR-15, and TR-20.
- Ideal for performing routine maintenance on Agilent 6890 and 7890 GCs.



Description	qty.	cat.#	price
Torx® Screwdriver Set	set	23034	



Plier Set

Includes 6-inch nose/side cutter, 6-inch wire cutter, and 6-inch adjusting pliers.



Description	qty.	cat.#	price
Plier Set	set	23033	



22999

Metric 9 Piece Ball-Point Hex Key Set

Includes 9 metric hex keys (Allen wrenches): 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10 mm.

Description	qty.	cat.#	price
Metric 9 Piece Ball-Point Hex Key Set	set	22999	

5-in-1 Magnetic Screwdriver

Magnetic power tip holds bits and screws securely.

Description	qty.	cat.#	price
5-in-1 Magnetic Screwdriver	set	23002	



23001

Wrench Set

Includes 4-inch, 6-inch, and 8-inch adjustable wrenches.

Description	qty.	cat.#	price
Wrench Set	set	23001	



1/16-Inch Tubing Cutter

- Produces square, smooth cuts in 1/16-inch tubing.
- Eliminates tubing distortion.
- Replaceable cutting wheel.

Description	qty.	cat.#	price
1/16" Tubing Cutter	ea.	20192	
Replacement Cutting Wheels	3-pk.	20185	

20192



Dimensions: 8" x 6 1/4" x 4 1/4"
 (20.3 x 15.9 x 10.8 cm)
 Weight: 11 lbs. (5.0 kg)

23029



SSI TC-20 Tube Cutting Machine

- Cuts 1/16", 1/8", or 1/4" tubing with inside diameter as small as 0.008".
- Electrically operated bench-top model.
- Handy dressing tool on the swing arm removes burrs and reams tubing.
- Voltage selectable 110–120/220–240 volts, 50–60 Hz.*

Description	qty.	cat.#	price
SSI Tubing Cutter Machine	ea.	23029	
SSI Replacement Cutting Wheels	3-pk.	23030	

*Unit shipped set for 110–120 operating voltage. Switch to 220–240 volts by using alternate fuse and power cord (included).

Ridgid® Tubing Cutter

- Excellent for cutting 1/8- or 1/4-inch metal tubing.*
- Compact size is ideal for tight spaces.
- Replaceable cutting wheel.



Description	qty.	cat.#	price
Ridgid Tubing Cutter for 1/8" or 1/4" metal tubing	ea.	22621	
Replacement Cutting Wheels			

*Not for use with stainless steel tubing

SUPPLIES & ACCESSORIES

Ridgid® Heavy-Duty Tubing Cutter

- Specifically designed to cut 3/16-1 1/8" stainless steel tubing.
- Large knob and 6 individual bearings for more control with less turning.
- Convenient fold-away reamer.

Description	qty.	cat.#	price
Ridgid Heavy-Duty Tubing Cutter	ea.	22621	



20193

1/16-Inch Tubing Cutting Pliers

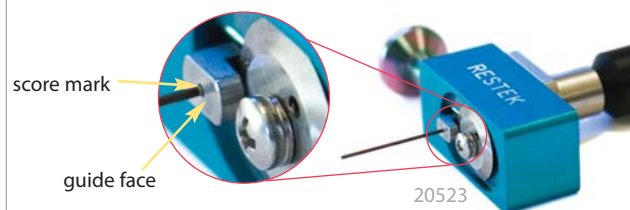
- Ideal for cutting 1/16-inch tubing.
- Cuts quickly, reducing distortion.
- Cuts clean, eliminating need for deburring.

Description	qty.	cat.#	price
1/16" Tubing Cutting Pliers	ea.	20193	

Leaves column entrance perfectly round.

Metal MXT® columns are easy to cut. Scoring wafers can be used, but may leave the column end irregularly shaped. The Restek tubing scorer is designed to make a perfect cut every time, leaving the column entrance perfectly round.

Enlarged view—score mark flush with guide face.



Description	qty.	cat.#	price
Restek Tubing Scorer for MXT Columns (0.25-0.53mm ID & 0.5-0.8mm OD)	ea.	20523	
Replacement Scoring Wheel	ea.	20522	



20188

Tubing Burring & Reaming Tool

Removes burrs and reams tubing.

Description	Size	qty.	cat.#	price
Tubing Dressing Tool	1/16"	ea.	20188	
Replacement Insert	for 1/16" Tubing Dressing Tool	ea.	20189	
Tubing Dressing Tool	1/8"	ea.	20190	
Replacement Insert	for 1/8" Tubing Dressing Tool	ea.	20191	



22627

Flexible Inspection Light

- Inspect inside surfaces of sample cylinders or other chambers.
- 14" reach.
- 100,000-hour LED life.

Description	qty.	cat.#	price
Flexible Inspection Light	ea.	22627	



20134

Tubing Reamer

- Removes burrs from stainless steel tubing.
- For 1/4- or 1/8-inch tubing.
- Nonslip safety design.

Description
Tubing Reamer



22622

Swaging Tool

- Preswage compression fittings for easy installation.
- Ideal for installations in tight areas.
- For Swagelok® fittings only.

qty.	cat.#	price
ea.	22622	



23009

Tubing Bender

- Bends 1/8-inch, 3/16-inch, or 1/4-inch tubing.
- Assists in making accurate left-hand, right-hand, or offset bends.

Description	qty.	cat.#	price
Tubing Bender	ea.	23009	

ResTape Teflon® Tape

- For threaded connections in a wide range of plumbing materials.
- Each roll is 1/2" x 260".
- Maximum temperature: 260 °C.



Description	Color	Uses	qty.	cat.#	price
ResTape	Green PTFE	oxygen service*	ea.	22485	
ResTape	Yellow PTFE	general gas service**	ea.	22486	
ResTape	Grey PTFE	stainless steel fittings***	ea.	22487	

*Compatible with gaseous or liquid oxygen, and with many other gases and liquids.

**Compatible with a broad range of gases and liquids.

***Anti-galling. Also compatible with many other metals and polymers.



22624

Gap Inspection Gauge

- Confirm that fittings are sufficiently tightened.
- For use with 1/4", 3/8", 1/2" Swagelok® fittings.
- For Swagelok® fittings in new installations only.

Description	qty.	cat.#	price
Gap Inspection Gauge	ea.	22624	