

# SUPPLIES & ACCESSORIES

## GC Accessories

### Instrument Supplies

Flowmeter .....	203
Leak Detector .....	204
Septa .....	205
Sky Inlet Liners .....	206-211
Technical Tips for Avoiding Inlet Problems .....	212
Liner Deactivations .....	213
Liner Packing Materials & Accessories .....	214-215
Supplies for Agilent GCs .....	216-243
Supplies For APEX Injectors .....	244
Supplies for ATAS Injectors .....	244
Supplies For PerkinElmer GCs .....	245-248
Supplies For Shimadzu GCs .....	249-252
Supplies For Thermo Scientific GCs .....	253-258
Supplies For Varian GCs .....	259-264
Packed Column Inlet Conversion .....	265-267
Dual Column Analysis .....	268-270
ELCD/PFPD Supplies .....	271
Purge & Trap Supplies .....	271
PID Lamps .....	271

### Column Installation

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

### Gas Purification Essentials

Gas Purification Solutions .....	295
Gas Purification .....	296-303
Gas Generators .....	304-308
Gas Regulators & Accessories .....	309-312
Fittings .....	313-317
Tubing & Valves .....	318-322
VCO Fittings .....	322
Installation Tools .....	323
Tubing & Fittings .....	323

## HPLC Accessories

Instrument Accessories & Parts .....	327-332
Tubing & Connections .....	332-335
Tools & Maintenance .....	336-337
Mobile Phase Accessories	
Bottle Tops .....	338-339
Dampers .....	340
Degassers .....	340-341
Filters .....	341-342
Heaters .....	343
Mixers & Splitters .....	344
Valves .....	345
Backpressure Regulators .....	345
Syringes .....	346-349
LC/MS Nitrogen Purification/Generation .....	350
Lab Organizers .....	350
Column Hardware .....	351

**RESTEK**

**CHROMALYTIC** +61(0)3 9762 2034  
ECHnology Pty Ltd

Australian Distributors  
Importers & Manufacturers  
[www.chromtech.net.au](http://www.chromtech.net.au)

**11/12**

# GC ACCESSORIES INSTRUMENT SUPPLIES

Flowmeter .....	203
Leak Detector .....	204
Septa .....	205
Sky Inlet Liners .....	206-211
Technical Tips for Avoiding Inlet Problems .....	212
Liner Deactivations .....	213
Liner Packing Materials & Accessories .....	214-215
<b>Supplies for Agilent GCs .....</b>	<b>216-243</b>
Supplies For APEX Injectors .....	244
Supplies for ATAS Injectors .....	244
<b>Supplies For PerkinElmer GCs .....</b>	<b>245-248</b>
<b>Supplies For Shimadzu GCs .....</b>	<b>249-252</b>
<b>Supplies For Thermo Scientific GCs .....</b>	<b>253-258</b>
<b>Supplies For Varian GCs .....</b>	<b>259-264</b>
Packed Column Inlet Conversion .....	265-267
Dual Column Analysis .....	268-270
ELCD/PFPD Supplies .....	271
Purge & Trap Supplies .....	271
PID Lamps .....	271

What's  
**NEW?**  
look for this  
circle



**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  $\pm 0.2$  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 measuring volumetric flow for most gases. Real-time measurements can be made for various types of flow paths, including continually changing gas types. This portable unit is designed for easy hand-held use, and the stand 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

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.



22657

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

**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 included 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

### Limits of Detection

These gases can be detected with the Restek Electronic Leak Detector at the following leak rates.

Gas	Minimum Detectable Leak Rate (atm cc/sec.)	Indicating LED Light Color
Helium	$1.0 \times 10^{-5}$	Red
Hydrogen*	$1.0 \times 10^{-5}$	Red
Nitrogen	$1.4 \times 10^{-3}$	Yellow
Argon	$1.0 \times 10^{-4}$	Yellow
Carbon Dioxide	$1.0 \times 10^{-4}$	Yellow

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](http://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.



Precision molded!

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	27156	27157
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)
<b>Agilent (HP)</b>	
5880A, 5890, 6850,	
6890, 7890, PTV	11
5700, 5880	9.5/10
On-Column Injection	5
<b>Thermo Scientific</b>	
TRACE GC	17
GCQ w/TRACE, PTV	17
8000 series	17
<b>Finnigan (TMQ)</b>	
GC 9001	9.5
GCQ	9.5
QCQ	9.5
TRACE 2000	9.5
<b>PerkinElmer</b>	
Sigma series	11
900,990	11
8000 series	11
Auto SYS	11
Auto SYS XL	11
<b>Shimadzu</b>	
All models	Plug
<b>SRI</b>	
All models	Plug
<b>Tracor</b>	
540	11.5
550,560	9.5
220,222	12.5
<b>Varian</b>	
Injector type:	
Packed column	9.5/10
1078/1079	10/11
1177	9
1075/1077	11

for **more** infoHow **Hot** is Your Septum?[www.restek.com/cat002](http://www.restek.com/cat002)**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 with state-of-the-art deactivation.
- Achieve lower detection limits for a wide range of active compounds.
- Use wool without risking the loss of sensitive analytes.

When faced with complex choices, simple solutions stand out. Sky™ inlet liners from Restek use a comprehensive, state-of-the-art deactivation and are the only blue liners on the market—making them an easy-to-recognize solution to common inlet problems.

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

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.



## 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.

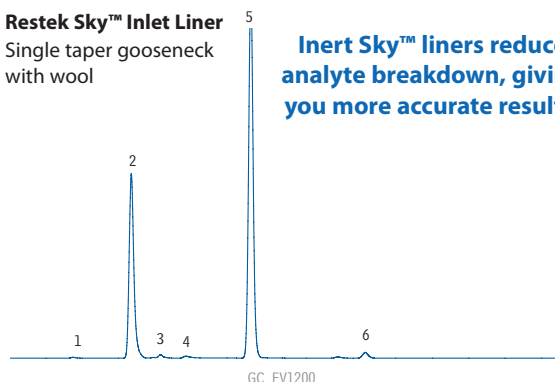
### Reduced Breakdown Improves Trace Analyses

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  $\mu$ 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.

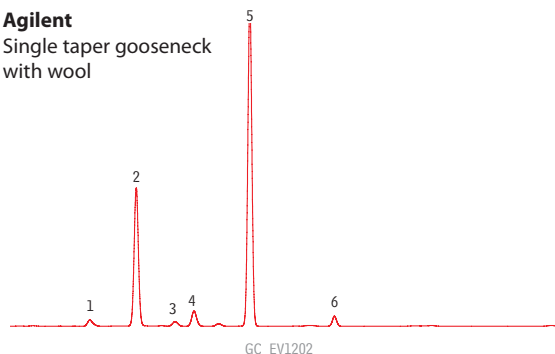
**Figure 1** Endrin and DDT breakdown is significantly reduced with Sky™ liners, demonstrating higher inertness.

**Restek Sky™ Inlet Liner**  
Single taper gooseneck  
with wool

**Inert Sky™ liners reduce  
analyte breakdown, giving  
you more accurate results.**



**Agilent**  
Single taper gooseneck  
with wool



	% 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  $\mu$ m (cat.# 13620); **Sample** endrin (50 ng/mL) and DDT (100 ng/mL) in hexane; **Injection** Inj. Vol.: 1  $\mu$ 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.

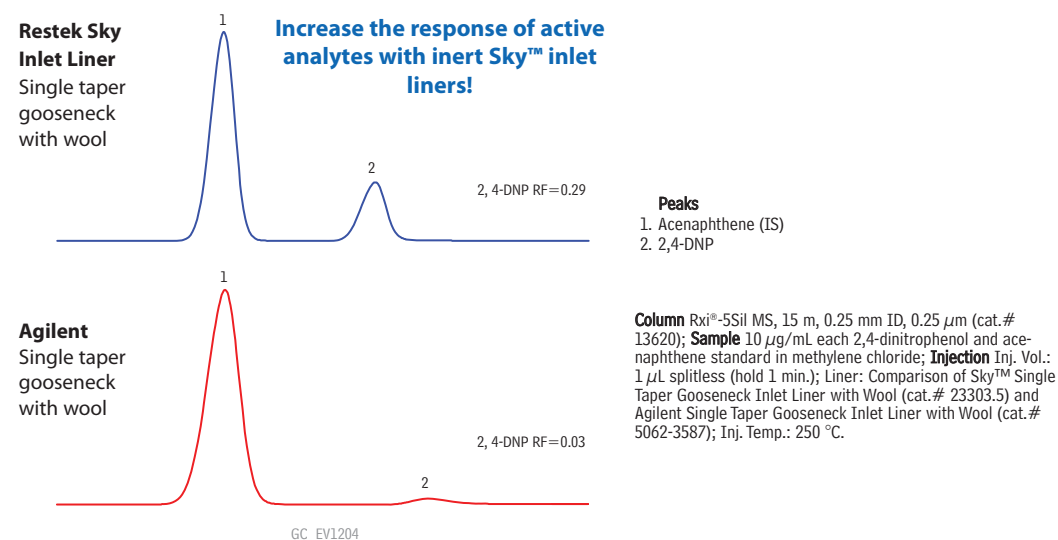


## Simple Solutions:

### 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.

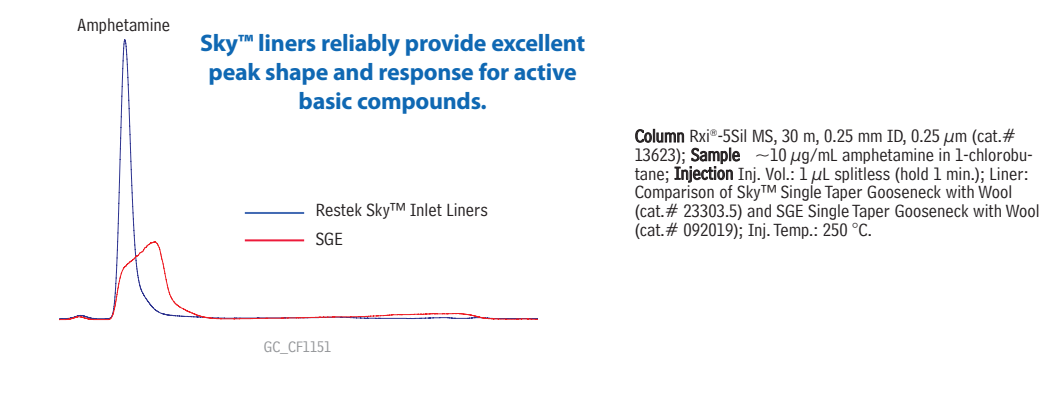
**Figure 2** The state-of-the-art deactivation used for Sky™ liners with wool results in higher responses for active acid compounds, such as 2,4-DNP.



### 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.

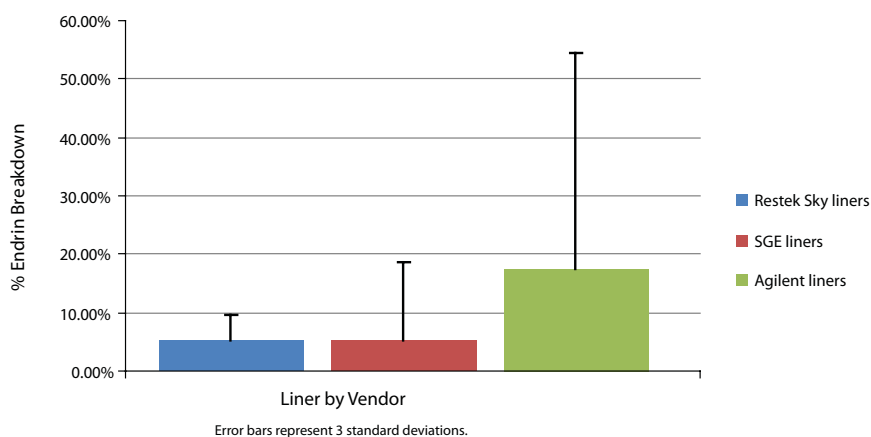


### Liner-to-Liner Reproducibility: A Measure of Consistent Quality

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 6.5mm x 78.5mm	5181-3315 (ea.) 5183-4705 (5-pk.) 5183-4706 (25-pk.)	23308.1	23308.5	23308.25
 4mm Cyclo Double Taper Gooseneck	4.0mm 6.5mm x 78.5mm		23310.1	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	19251-60540 (ea.) 5183-4691 (5-pk.) 5183-4692 (25-pk.)	23304.1	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 Cyclo splitter	4.0mm 6.3mm x 78.5mm		23312.1	23312.5	23312.25

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	

COLUMN INSTALLS THIS END






## 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.	25-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 8.0mm x 105mm	453 20030	23323.1	23323.5	23323.25
 5mm Straight w/Wool	5.0mm 8.0mm x 105mm		23324.1	23324.5	23324.25
 5mm Precision Liner w/Wool	5.0mm 8.0mm x 105mm		23327.1	23327.5	
Splitless 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 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.	25-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

COLUMN INSTALLS THIS END





## 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 a 10 psig head-pressure.*

*For a straight 4mm ID x 78.5mm long liner, the effective liner volume is approximately 500µL.*

Injection Volume (µL)	Expansion Volume (µL)				
	H <sub>2</sub> O	C <sub>2</sub> S	CH <sub>2</sub> Cl <sub>2</sub>	Hexane	Isooctane
0.5	<del>710</del>	212	200	98	78
1.0	<del>1420</del>	423	401	195	155
2.0	<del>2840</del>	<del>846</del>	<del>802</del>	390	310
5.0	<del>7100</del>	<del>2120</del>	<del>2000</del>	<del>975</del>	<del>775</del>

— indicates expansion volume exceeds effective 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 semivolatile 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	-213.1	addl. cost	-216.1	addl. cost
5-pk.	-214.5	\$20	addl. cost	-213.5	addl. cost	-216.5	addl. cost
25-pk.	-214.25	\$90	addl. cost	-213.25	addl. cost	-216.25	addl. cost

### Base Deactivation

- Excellent inertness for basic compounds.
- Recommended for use with Rtx®-5 Amine, Rtx®-35 Amine, and Stabilwax®-DB 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

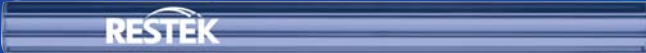
Inlet liners are the key to good injection port maintenance; changing them regularly helps prevent problems such as:

- 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.

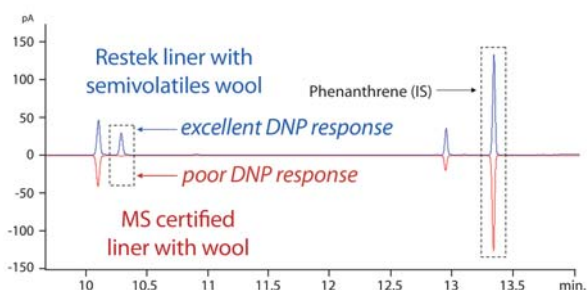
**See pages 206-211 for details.**



### 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 in prepacked liners, add the corresponding suffix number to the liner catalog number.

qty.	IP Deactivated Liner with Semivolatiles Wool		
each	-231.1	\$16	addl. cost
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-insertor tool listed below.\*



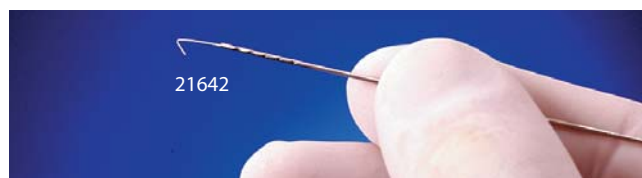
Add the corresponding suffix number to the liner catalog number.

Description	suffix	price
each	-209.1	addl. cost
5-pk.	-209.5	addl. cost
25-pk.	-209.25	addl. cost

\*Liners with IDs less than 3.5mm are difficult to pack. We will pack them on a custom basis (minimum neck ID of 2mm required).

### Replacement CarboFrit® Inserts

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



### CarboFrit® Puller/Insertor Tool

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

Description	qty.	cat.#	price
CarboFrit Puller/Insertor 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	



Eliminates user variation!

**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	



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!

**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	

**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.
 <b>2mm Splitless</b>	trace samples <2μL	2.0mm 6.5mm x 78.5mm	5181-8818 (ea.) 5183-4703 (5-pk.) 5183-4704 (25-pk.)	20712	20713	20714
 <b>4mm Splitless</b>	trace samples >2μL	4.0mm 6.5mm x 78.5mm	210-3003 (ea.) 210-3003-5 (5-pk.)	20772	20773	20774
 <b>4mm Splitless w/Wool</b>	trace samples >2μL	4.0mm 6.5mm x 78.5mm	19251-60540 (ea.) 5183-4691 (5-pk.) 5183-4692 (25-pk.)	22400	22401	22402
 <b>5mm Splitless</b>	accommodates more polar solvents and lower MW solvents	5.0mm 6.5mm x 78.5mm	<b>NEW!</b>	22975	22976	—
 <b>2mm Splitless (Quartz)</b>	trace samples <2μL	2.0mm 6.5mm x 78.5mm	18740-80220 (ea.) 5183-4707 (5-pk.)	20914	20915	—
 <b>4mm Splitless (Quartz)</b>	trace samples >2μL	4.0mm 6.5mm x 78.5mm	—	20912	20913	—
 <b>4mm Splitless w/Wool (Quartz)</b>	trace samples >2μL	4.0mm 6.5mm x 78.5mm	—	22403	22404	—
 <b>Gooseneck Splitless (2mm)</b>	trace samples <2μL	2.0mm 6.5mm x 78.5mm	—	20795	20796	20797
 <b>Gooseneck Splitless (4mm)†</b>	trace samples >2μL	4.0mm 6.5mm x 78.5mm	5181-3316 (ea.) 5183-4695 (5-pk.) 5183-4696 (25-pk.)	20798	20799	20800
 <b>Gooseneck Splitless (4mm) w/Wool†</b>	trace samples >2μL	4.0mm 6.5mm x 78.5mm	5062-3587 (ea.) 5183-4693 (5-pk.) 5183-4694 (25-pk.)	22405	22406	22407
 <b>Gooseneck Splitless (5mm)</b>	accommodates more polar solvents and lower MW solvents	5.0mm 6.5mm x 78.5mm	<b>NEW!</b>	22973	22974	—
 <b>Double Gooseneck Splitless (4mm)</b>	trace, active samples >2μL	4.0mm 6.5mm x 78.5mm	5181-3315 (ea.) 5183-4705 (5-pk.) 5183-4706 (25-pk.)	20784	20785	20786
 <b>Cyclo Double Gooseneck (2mm)</b>	trace, active, dirty samples <2μL	2.0mm 6.5mm x 78.5mm	—	20907	20908	—
 <b>Cyclo Double Gooseneck (4mm)</b>	trace, active, dirty samples >2μL	4.0mm 6.5mm x 78.5mm	—	20895	20896	20997
 <b>Recessed Gooseneck (2mm)**</b>	base easily packs with wool for dirty samples <2μL	2.0mm 6.5mm x 78.5mm	—	20980	20981	20982
 <b>Recessed Gooseneck (4mm)**</b>	base easily packs with wool for dirty samples >2μL	4.0mm 6.5mm x 78.5mm	—	20983	20984	20985
 <b>Recessed Gooseneck (4mm) w/Wool**</b>	base easily packs with wool for dirty samples >2μL	4.0mm 6.5mm x 78.5mm	—	22408	22409	22410
 <b>Recessed Double Gooseneck (4mm)**</b>	trace, active samples >2μL	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?**






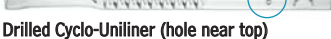





See pages 206-211 for details.

Split Liners for Agilent GCs	Benefits/Uses	ID* OD x Length	Similar to Agilent part#	ea.	cat.#/price 5-pk.	25-pk.
 <b>1mm Split**</b>	for purge & trap inlet splitting or sample <1µL	1.0mm 6.3mm x 78.5mm	18740-80200 (ea.) 5183-4709 (5-pk.)	20972	20973	—
 <b>4mm Split w/Wool</b>	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
 <b>Laminar Cup Splitter</b>	high MW compounds	4.0mm 6.3mm x 78.5mm	—	20801	20802	—
 <b>mini-Lam Split</b>	high MW compounds	4.0mm 6.3mm x 78.5mm	—	20990	20991	—
 <b>Cup Splitter</b>	high & low MW compounds	4.0mm 6.3mm x 78.5mm	18740-80190 (ea.) 5183-4699 (5-pk.)	20709	20710	—
 <b>Cycloplitter</b>	dirty samples, many injections before cleaning required	4.0mm 6.3mm x 78.5mm	—	20706	20707	20708
 <b>2mm Split Precision Liner w/Wool</b>	dirty samples, trace samples	2.0mm 6.3mm x 78.5mm	—	20823	20824	—
 <b>4mm Split Precision Liner w/Wool</b>	dirty samples, trace samples	4.0mm 6.3mm x 78.5mm	210-4004-5 (5-pk.)	21022	21023	20979
 <b>4mm Gooseneck Precision Liner w/Wool</b>	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	Benefits/Uses	ID* OD x Length	Similar to Agilent part #	ea.	cat.#/price 5-pk.	25-pk.
 <b>Low Pressure Drop Precision Liner w/Wool</b>	universal	4.0mm 6.3mm x 78.5mm	—	21032	21033	—
 <b>Low Pressure Drop Liner w/Wool</b>	universal	4.0mm 6.3mm x 78.5mm	5183-4647, 5183-4711 (ea.) 5183-4701, 5183-4712 (5-pk.) 5183-4713 (25-pk.)	20994	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.
 <b>PTV On-Column Liner</b>	allows on-column injection with a 0.53mm ID column	1.7mm 3.0mm x 71mm	—	24976	24977	—
 <b>Straight Glass</b>	general use	2.0mm 3.0mm x 71mm	5183-2036	—	—	21157
 <b>Baffled Glass</b>	active compounds, drugs, pesticides	1.5mm 3.0mm x 71mm	5183-2037	—	—	21704
 <b>Glass w/Wool</b>	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.	
 <b>SPME Liner</b>	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	trace, dirty, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm	NEW!	22272	22273	—

\*Nominal ID at syringe needle expulsion point.

\*\*Hole in Drilled Uniliner liner makes direct injection possible with EPC-equipped Agilent 6890 & 7890 GCs!

## i tech tip

### Drilled Uniliner® Liners

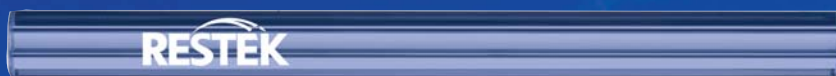
Use the Drilled Uniliner® liner with the hole near the bottom for semivolatiles analysis or when compounds of interest could be affected by a tailing solvent peak. Use the Drilled Uniliner® liner with the hole near the top for chlorinated pesticides analysis, aqueous injections, as well as for analysis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

All liners are  
**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.	Similar to Agilent part #	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 #	10-pk. cat.#	price	50-pk. cat.#	price
6.35mm ID Graphite O-Rings for split liners	450°C	5180-4168	20296		20297	
6.5mm ID Graphite O-Rings for splitless liners	450°C	5180-4173	20298		20299	

## 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	

## IceBlue® Septa



## Septa for Agilent GCs

Preconditioned and ready to use!

Septum Diameter	25-pk./price	50-pk./price	100-pk./price
<b>Thermolite Septa</b> (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

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

<b>BTO Septa</b> (usable to 400°C inlet temp.)			
5mm CenterGuide		27100	27101
9.5mm (3/8")		27106	27107
10mm		27108	27109
11mm (7/16") CenterGuide		27110	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 allows use of 26-gauge needles for on-column injections.
- Made of high-quality stainless steel.



21309

Description	Similar to Agilent part #	qty.	cat.#	price
Septum Nut, Autosampler & PTV (for 23-gauge needles)	18740-60835	ea.	20631	
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	

### Rethreading Tool

for Agilent Split/Splitless Injection Ports

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



23018

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



**Make your injection port threads like new!**

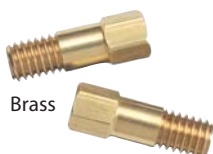
Screw the tool completely onto the injection port in a clockwise direction. Unscrew the tool and inspect the threads, repeat as necessary. When done, wipe threads with methanol to remove any debris.

Description	qty.	cat.#	price
Rethreading Tool for 1/4" compression fittings (Agilent split/splitless injection ports)	ea.	23018	



### 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
<b>For use with "compact" Agilent-style ferrules.</b>				
Stainless Steel Capillary Column Nut	5181-8830	2-pk.	21884	
Brass Capillary Column Nut	5181-8830	2-pk.	21878	
<b>For use with standard 1/16"-type ferrules.*</b>				
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

### Hot Swap Capillary Column Nuts

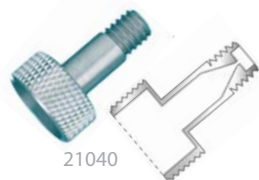
- No more burned fingers!
- No more downtime waiting for injector parts to cool down.



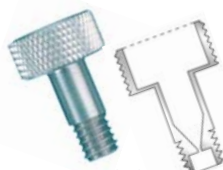
22347

Never worry again about burned fingers or having to wait for the 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
<b>For use with "compact" Agilent-style ferrules.</b>			
Hot Swap Capillary Column Nut	ea.	22348	
<b>For use with standard 1/16"-type ferrules.</b>			
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
<b>For use with "compact" Agilent-style ferrules.</b>				
Finger-Tight Capillary Column Nuts	5020-8293,	2-pk.	21040	
	5020-8292			
<b>For use with standard 1/16"-type ferrules.</b>				
Finger-Tight Capillary Column Nuts	5020-8293,	2-pk.	21041	
	5020-8292			



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
<b>For use with "compact" Agilent-style ferrules.</b>			
Finger-Tight Capillary Column Nut	ea.	21311	
<b>For use with standard 1/16"-type ferrules.</b>			
Finger-Tight Capillary Column Nut	ea.	21312	



21034



21399

### Capillary Installation Gauge

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

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	



1/16" Adaptor Fitting

## 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.

### 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!**

Patented



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

0.8mm ID Flip Seal Dual Vespel Ring Inlet Seal	2-pk./price	10-pk./price
Gold-Plated	23407	23409
Siltek Treated	23408	23410
1.2mm ID Flip Seal Dual Vespel Ring Inlet Seal	2-pk./price	10-pk./price
Gold-Plated	23411	23413
Siltek Treated	23412	23414
Flip Seal Dual Vespel Ring Inlet Seal Kit	qty.	cat.# price
Includes: gold-plated 0.8mm ID inlet seal, reducing nut adaptor, 1/16" SS nut	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.



Vespel® ring seal on top and bottom surfaces!

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.



Now available in economical 50-pks.

Single-Column Installation 0.8mm ID (Opening)	Similar to Agilent part #	2-pk./price	10-pk./price	50-pk./price
Gold-Plated	18740-20885	21317	21318	23415
Siltek Treated		21319	21320	23416
Stainless Steel	18740-20880	21315	21316	23417

0.25/0.32mm ID Dual-Column Installation 1.2mm ID (Opening)	2-pk./price	10-pk./price
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



Note: The 1.2 mm inlet seal is recommended when installing two columns using a two-hole Vespel®/graphite 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 secured in the Weldment Removal Tool until you 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	✓	



## EZ Twist Top® Split/Splitless Injection Port for Agilent 7890 GCs

Description	qty.	cat.#	price
<b>Injection Port Assembly Kit</b> Includes: 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	22177	
<b>Injection Port Assembly Kit, Siltek Treated</b> 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](http://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
<b>Complete Injection Port Assembly Kit</b> 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	
<b>Complete Injection Port Assembly Kit, Siltek Treated</b> 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
<b>Injection Port Assembly Kit</b> 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	
<b>Injection Port Assembly Kit, Siltek Treated</b> 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.	22723	
Shell Weldment, Siltek Treated	ea.	22730	
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!**

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

Description	qty.	cat.#	price
<b>Injection Port Assembly Kit</b> 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	
<b>Injection Port Assembly Kit, Siltek Treated</b> 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!**



### 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**

**CHROMALYTIC** +61(0)3 9762 2034  
ECHnology Pty Ltd

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

**11/12**

www.restek.com **225**

**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	


**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	

**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



### 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	007542-000-00	ea.	22352	



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	



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	

#### GRAPHPACK® 2m Ferrules



Fits Column ID	Similar to Gerstel part #	qty.	cat.#	price
0.25mm	001805-040-00	10-pk.	22223	
0.32mm	001805-045-00	10-pk.	22224	
0.53mm	001805-007-00	10-pk.	22225	

### 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

Topical and timely insights from top chromatographers.

Visit us at [blog.restek.com](http://blog.restek.com)





**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	
0.8mm ID Dual Vespel Ring Inlet Seal, Gold-Plated	2-pk.	21240	
	10-pk.	21241	



**Direct Replacement Reducing Nut**

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

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



**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.



**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	



**Catch the Buzz**

Sign up for Restek's e-newsletter, *The Buzz*  
[www.restek.com/buzz](http://www.restek.com/buzz)

**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	

**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	

**Oven Temperature Sensor Assembly**

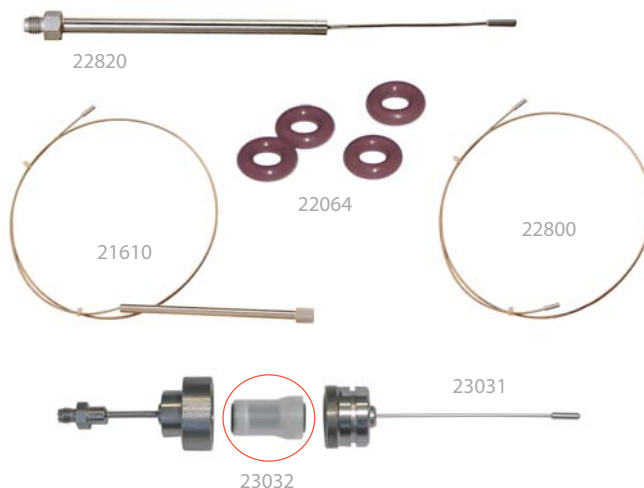
for Agilent GCs

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	

**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	

**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 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	

also **available**

Looking for septa for Agilent GCs?

See **page 219** or visit [www.restek.com](http://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	05890-80560	ea.	22994	
Oven Flapper Assembly for Agilent 6890 GCs	G1530-80560	ea.	22995	
Replacement Insulation Gasket and Hardware Kit*		kit	22996	

\*Fits Restek's Oven Flapper Assembly only.



### 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	

### 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 in injection ports, fittings, etc.
- Built-in guide to prevent cross-threading.



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	

**Sky**  
Inlet Liners

Looking for a  
Simple Solution?

RESTEK

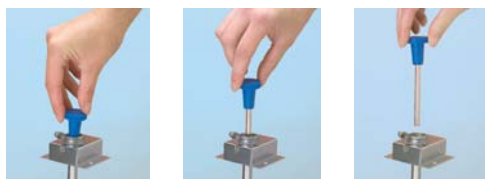
New Sky™ liners, featuring a state-of-the-art deactivation, give you the inertness you need for accurate, reproducible trace level results.

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!

### Make Life Easier (MLE) Capillary Tool Kit for Agilent GCs

#### Includes:

- capillary installation gauge for Agilent GCs
- injector wrench for Agilent GCs
- septum nut removal tool
- 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
- 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 for Agilent GCs	kit	22186	

### 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	



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.

### 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	



## 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	Fits same liner adaptor as Agilent part #	qty.	cat.#	price
DI Uniliner Liner for Agilent 5890 Packed Column GC (1.7mm ID x 3.0mm OD x 93mm)	5181-3382, 5080-8732	ea.	20964	
		5-pk.	20965	
		25-pk.	20966	

### 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.



Description	Similar to Agilent part #	qty.	cat.#	price
Siltek Septum Packed Purge Port Weldment for Agilent 5890 GCs	19243-80570	ea.	21691	
Viton Replacement O-rings	5080-8898	10-pk.	21685	

### 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
<b>Micropacked Column Adaptor Kit for Split/Splitless Injection</b>			
<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	
<b>Micropacked Column Adaptor Kit for On-Column Injection</b>			
<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	
<b>Replacement Inlet Seals for Micropacked Column Adaptor</b>			
Dual Vespel Ring Inlet Seals, large bore (2)	2-pk.	22429	
<b>Replacement Metal Liner Installation Guide for On-Column Injection, Siltek Treated</b>	ea.	22430	
<b>Replacement 4mm Splitless Liner</b>	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	



### 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	

### 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	



For use with 0.53 mm ID columns.

### 1/8-Inch Capillary Inlet Adaptor Fitting Kit

(Split/splitless fitting for 0.53 mm 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	

### 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**

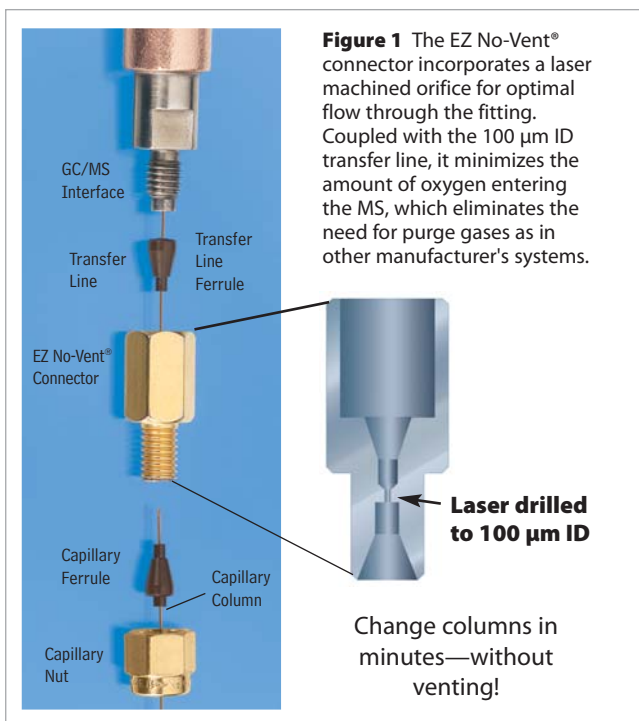
**Looking for more information or products on dual column analyses?**

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.

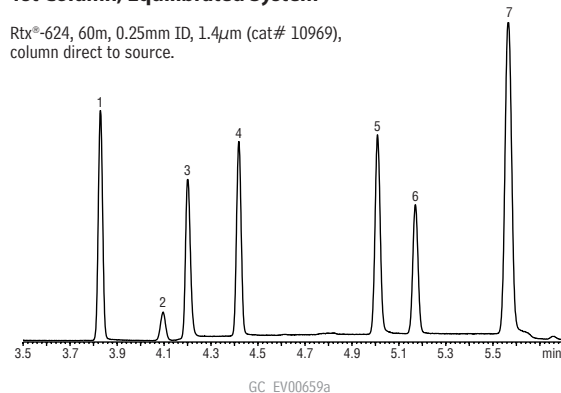


**Figure 1** The EZ No-Vent® connector incorporates a laser machined orifice for optimal flow through the fitting. Coupled with the 100 µm ID transfer line, it minimizes the amount of oxygen entering the MS, which eliminates the need for purge gases as in other manufacturer's systems.

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

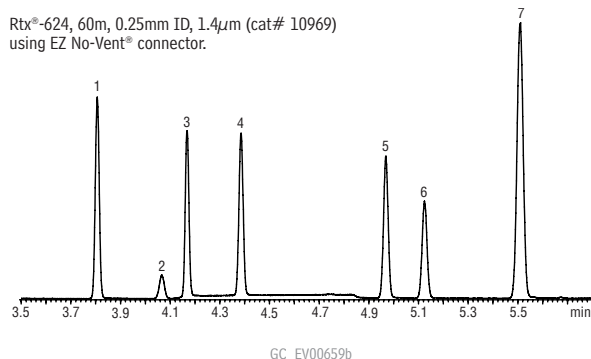
### 1st Column, Equilibrated System

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.



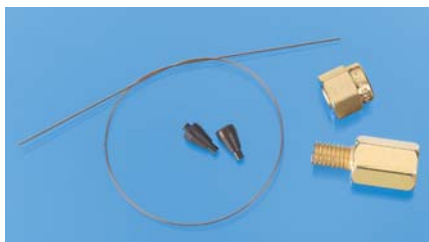
1. dichlorodifluoromethane
2. 1,2-dichlorotetrafluoroethene (Freon® 114)
3. chloromethane
4. vinyl chloride
5. bromomethane
6. chloroethane
7. trichlorofluoromethane

Sample: Volatile Gas Mix 502.2 Calibration Mix#1 (gases) cat# 30042  
Inj.: 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

restek  
innovation!

Kit installs easily,  
without special  
tools or plumbing.



Description	qty.	cat.#	price
<b>EZ No-Vent Connector Kit</b>			
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	

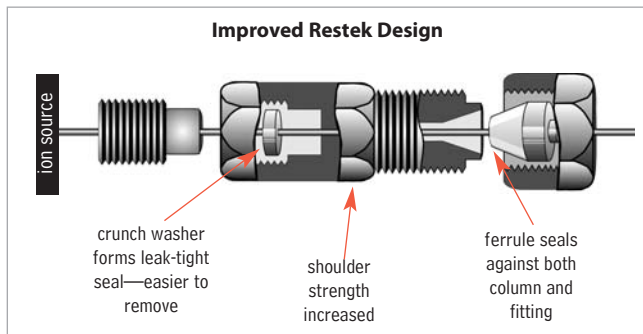
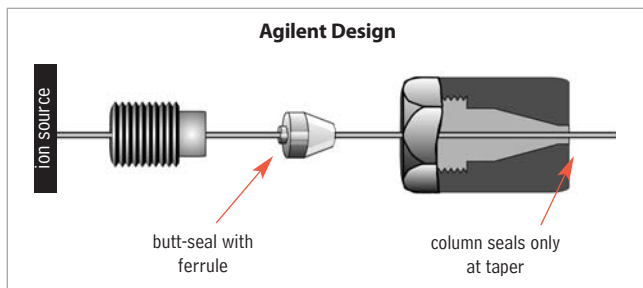


## Restek MSD Conversion Fitting

- 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 crush 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	

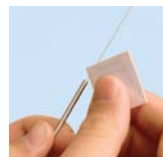
## restek innovation!

### 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	



### 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, ready for immediate installation. This keeps the instrument downtime to a minimum.

### did you **know**?

A typical ETP electron multiplier has a total active dynode surface area of ~1,000 mm<sup>2</sup> compared to a standard continuous dynode multiplier that only has a total channel surface area of around 106 mm<sup>2</sup>. The increased surface area of the ETP slows the aging process and improves operating life.

Description	qty.	cat.#	price
<b>Electron Multipliers for Agilent GC/MS and LC/MS</b>			
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.

### also **available**

Other ETP Electron Multipliers are available upon request. Call us if you do not see your instrument listed.

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](http://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](mailto: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.



24819

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	



27194

## GC/MS Cleaning Kit

Poor sensitivity, loss of sensitivity at high masses, or high multiplier gain during an auto tune are all indicators that your mass spectrometer source may need to be cleaned. Restek has assembled all of the necessary components for cleaning and polishing 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 Collector Housing Kits 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	



### 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	G1531-80630	ea.	23053	

Note: 6890 GC connections to EPC modules are not compatible with the 7890 EPC modules.

### Spanner Wrench for Agilent 5890/6890/6850/7890 FID Collector Assemblies

- Easily remove the nut from the FID collector without damaging the nut.
- 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...



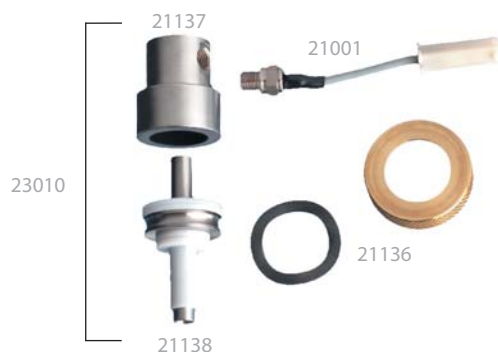
...then turn counterclockwise...



...and remove.

Description	Similar to Agilent part #	qty.	cat.#	price
Spanner Wrench for Agilent 5890/6890/6850/7890 FID Collector Assembly	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	
FID Collector (includes insulators)	19231-20970, 19231-20960, 19231-20950, 19231-20940,	ea.	21138	
FID Collector Nut and Washer	5181-3311	set	21136	
FID Ignitor*	19231-60680	ea.	21001	
FID Ignitor Castle	19231-20910	ea.	21137	
Siltek FID Ignitor Castle		ea.	21135	

\*Also fits OI Analytical 4410 detector (similar to OI 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	
FID Collector (includes insulators)	G1531-20690, G1531-20700, 19231-20940,	ea.	21139	
FID Collector Nut and Washer	5181-3311	set	21136	
FID Ignitor*	19231-60680	ea.	21001	
FID Ignitor Castle	19231-20910	ea.	21137	

\*Also fits OI Analytical 4410 detector (similar to OI part # 191833).



### 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 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.

#### 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	G1531-80560	ea.	21621	\$46	3-pk.	21682	
High-Performance Siltek Treated, 0.011-Inch ID Tip	G1531-80560	ea.	21620	\$51	3-pk.	21683	
High-Temperature, 0.018-Inch ID Tip	G1531-80620	ea.	23078	\$53	3-pk.	23079	

### Packed Column FID Replacement Jets for Agilent 5890/6890/6850 GCs

- 0.018-inch ID jets: Used for most general-purpose packed column applications.
- 0.030-inch ID jets: For packings that exhibit high bleed and 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	

restek  
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 ( $\frac{1}{8}$ ",  $\frac{3}{16}$ ",  $\frac{1}{4}$ ").
- Pipe cleaner.
- Stainless steel tube brushes ( $\frac{3}{8}$ ",  $\frac{3}{16}$ ",  $\frac{1}{4}$ ").
- Stainless steel surface brush.
- Stainless steel jet reamers.
- Emery cloth.

Description	qty.	cat.#	price
FID/Injector Cleaning Kit	kit	20120	

### 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	



20884

### FID/NPD Adaptor Fitting

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

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



22077

### FID/NPD Capillary Adaptor Fitting

for Agilent 5890/6890/6850 GCs

- High-quality stainless steel construction.
- Meets or exceeds original manufacturer's performance.

Description	Similar to 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,  $\frac{1}{4}$ " nut, Vespel/graphite ferrule,  $\frac{1}{16}$ " 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	



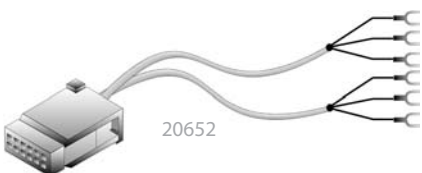
Connect an Agilent 5890 GC to an Agilent 3396 integrator to enable remote starts (non-Inet connection from GC to integrator).

Description	Similar to Agilent part #	length	qty.	cat.#	price
Replacement Cable	03394-60560	6 ft.	ea.	20654	



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 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 3396 integrator to a non-Agilent GC.

Description	Similar to Agilent part #	length	qty.	cat.#	price
Replacement Cable	35900-60630	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	G2613-20500	ea.	21172	
Parking Post for Agilent 7673/7683 Series Autosamplers for use with 5890/6890/7890 GCs	05890-61525	ea.	22343	



### 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	



### 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	



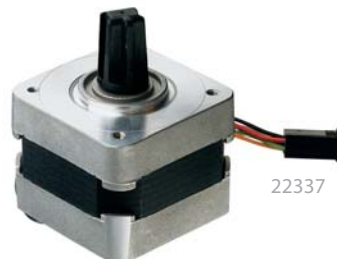
### Carriage Motor Belt for Agilent 7673A & 7683B Autosamplers

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



### Z-Belt for Agilent 7673B Autosampler

Description	Similar to Agilent part #	qty.	cat.#	price
Z-Belt for Agilent 7673B Autosampler	1500-0803	ea.	22332	



### 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	






also **available**  
**Autosampler Vials**

See pages 353-365.





## Liners for APEX ProSep 800 &amp; 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
	<b>MIDI II (2.0mm ID)</b>				

\*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	

restek **innovation!**

## 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	







## Septum Puller

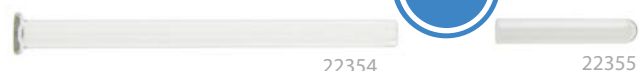
- Use hooked end for removing septa and O-rings; pointed end works well for removing stuck ferrules or debris.
- Keep several on hand in your laboratory—can be used in many different ways.

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

## Liners for ATAS Injectors

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


















\*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.
 <b>Straight</b>	universal, for most common analyses	3.5mm 5.0mm x 100mm	N6502008	20736	20737	—
 <b>Cup Splitter</b>	high & low MW compounds	3.5mm 5.0mm x 100mm	—	20739	20740	—
 <b>Cyclosplitter</b>	dirty samples, many injections before cleaning required	3.5mm 5.0mm x 100mm	—	20745	20746	—
 <b>Auto SYS Splitter w/Wool</b>	universal for most common analyses	4.0mm 6.2mm x 92.1mm	N6502009	20832	20833	20834
 <b>Auto SYS Cup Splitter</b>	high & low MW compounds	4.0mm 6.2mm x 92.1mm	N6502011	20835	20836	—
 <b>Auto SYS Cyclosplitter</b>	dirty samples, many injections before cleaning required	4.0mm 6.2mm x 92.1mm	N6502012	20910	20911	—
 <b>Auto SYS Laminar Cup Splitter</b>	high MW compounds	4.0mm 6.2mm x 92.1mm	—	20827	20828	—
 <b>Auto SYS Split Precision Liner w/Wool</b>	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.
 <b>Splitless (2mm ID)</b>	trace samples	2.0mm 5.0mm x 100mm	N6502007	20730	20731	20732
 <b>Auto SYS Splitless</b>	headspace & purge & trap	1.0mm 6.2mm x 92.1mm	N6502006	21272	21273	21274
 <b>Auto SYS Splitless (2mm ID) w/Wool</b>	trace samples	2.0mm 6.2mm x 92.1mm	N6121021	20829	20830	—
 <b>Auto SYS Double Gooseneck</b>	trace, active samples up to 4µL	4.0mm 6.2mm x 92.1mm	N6502003	20853	20854	—
 <b>Auto SYS Cyclo Double Gooseneck</b>	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.
 <b>PSS Split/Splitless (1mm ID)</b>	trace samples	1.0mm 4.0mm x 86.2mm	N6121006	20738	20741	—
 <b>Auto SYS XL PSS Split/Splitless w/Wool</b>	most common analyses	2.0mm 4.0mm x 86.2mm	N6121004	21717	21718	—
 <b>PSS Drilled Uniliner (hole near top)</b>	trace, active samples, high recovery & linearity	2.0mm 4.0mm x 86.2mm		22986	22987	—
 <b>PSS Drilled Uniliner (hole near bottom)</b>	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**

**HROMalytic** +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	—
<b>Zero Dilution Inner Liner</b>							
		headspace analysis	2.5mm 6.2mm x 90mm	N1011445	22992	22993	—
<b>Zero Dilution Outer Liner</b>							
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	—
<b>Zero Dilution Inner Liner</b>							
		headspace analysis	2.5mm 4.2mm x 83mm	N1011447	24978	24979	—
<b>Zero Dilution Outer Liner</b>							
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
<b>PTV Press-Tight</b>							
		high linearity	1.0mm 2.0mm x 88mm	—	20742	20743	20744
<b>1.0mm PTV Liner</b>							
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.
		trace, active samples, high recovery & linearity	3.5mm 5.0mm x 100mm	N6502018	20855	20856	—
<b>Uniliner</b>							
		trace, dirty, active samples, high linearity	3.5mm 5.0mm x 100mm	N6502019	20857	20858	—
<b>Cyclo-Uniliner</b>							
		trace, dirty, active samples, high recovery & linearity	4.0mm 6.2mm x 92.1mm	N6502016	20837	20838	—
<b>Auto SYS Open-top Uniliner w/Wool</b>							
		trace, dirty, high MW active samples, high linearity	4.0mm 6.2mm x 92.1mm	N6502017	20839	20840	—
<b>Auto SYS Cyclo-Uniliner</b>							
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	—
<b>Auto SYS Drilled Uniliner (hole near top)</b>							
		trace, active samples, high recovery & linearity	4.0mm 6.2mm x 92.1mm	N6502013	21293	21294	—
<b>Auto SYS Drilled Uniliner (hole near bottom)</b>							
		trace, active samples, high recovery & linearity	4.0mm 6.2mm x 92.1mm	N6502014	21295	21296	—
<b>Auto SYS Gooseneck Drilled Uniliner (hole near top)</b>							
		trace, active samples, high recovery & linearity	4.0mm 6.2mm x 92.1mm	N6502015	21297	21298	—
<b>Auto SYS Gooseneck Drilled Uniliner (hole near bottom)</b>							

\*Nominal ID at syringe needle expulsion point.

### 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.	Similar to PE part #	qty.	cat.#	price
Silicone O-Rings for PerkinElmer Auto SYS XL or Clarus with CAP Injector	250°C	N6101374	10-pk.	20262	

IceBlue®



Precision molded!

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	
Replacement Septum for PerkinElmer Kits (1 septum)	21-01w	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
<b>For use with PE style capillary nuts</b>				
Injector Adaptor for PerkinElmer Auto SYS XL	N6100157	ea.	22318	
Siltek Treated Injector Adaptor for PerkinElmer Auto SYS XL	—	ea.	22320	
<b>For use with 1/8" compression style nuts</b>				
Injector Adaptor for PerkinElmer Auto SYS XL	—	ea.	22319	

### 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
<b>For use with PE style capillary nuts</b>				
FID Capillary Column Adaptor for PerkinElmer Auto SYS XL	N6120020	ea.	22608	
<b>For use with 1/8" compression style nuts</b>				
FID Capillary Column Adaptor for PerkinElmer Auto SYS XL		ea.	22609	

**RESTEK**

**CHROMALYTIC** +61(0)3 9762 2034  
ECH nology Pty Ltd

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

11/12

www.restek.com

**247**



**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	

**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	

**also available**

Restek carries Swagelok® fittings in brass & stainless steel. See pages 313-315 or visit [www.restek.com](http://www.restek.com) and search on Swagelok.



Everything you need  
in one complete kit!

**Make Life Easier (MLE) Capillary Tool Kit**  
for PerkinElmer GCs**Includes:**






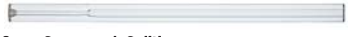
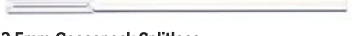

- 1/8", 3/16", and 1/4" nylon brushes
- 1/4", 3/8", and 3/16" stainless steel wire tube brushes
- stainless steel surface brush
- 6 stainless steel jet reamers (0.25–0.65 mm OD)
- 1/4" x 5/16" open end wrench
- 3/8" x 7/16" open end wrench
- 7/16" x 1/2" open end wrench
- 1/2" x 9/16" open end wrench
- 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	kit	22185	

**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 tightening a wide variety of chromatography fittings.









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

Split Liners for Shimadzu 14A GCs	Benefits/Uses:	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.#/price 5-pk.	25-pk.
 <b>Split</b>	universal, for most common analyses	3.5mm 5.0mm x 99mm	221-32544-01	20860	20861	20862
 <b>Cyclo splitter</b>	dirty samples, many injections before cleaning required	3.5mm 5.0mm x 99mm	—	20870	20871	—
 <b>Laminar Cup Splitter</b>	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.
 <b>3.5mm Splitless</b>	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.
 <b>Uniliner</b>	trace, active samples, high recovery & linearity	3.5mm 5.0mm x 99mm	—	20876	20877	—
 <b>Cyclo-Uniliner</b>	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.
 <b>1mm Split</b>	purge & trap, fast GC	1.0mm 5.0mm x 95mm	—	20976	20977	20978
 <b>3.5mm Split</b>	universal, for most common analyses	3.5mm 5.0mm x 95mm	221-41444-01	22283	22284	22285
 <b>2mm Split Precision Liner w/Wool</b>	dirty samples, trace samples	2.0mm 5.0mm x 95mm		22171	22172	—
 <b>3.5mm Split Precision Liner w/Wool</b>	dirty samples, trace samples	3.5mm 5.0mm x 95mm	—	21020	21021	—
 <b>Single Gooseneck w/Wool</b>	dirty samples, trace samples	3.5mm 5.0mm x 95mm		22173	22174	—
 <b>Cyclo splitter</b>	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.
 <b>2mm Gooseneck Splitless</b>	universal, trace samples	2.0mm 5.0mm x 95mm	—	22276	22277	—
 <b>3.5mm Gooseneck Splitless</b>	universal, trace samples	3.5mm 5.0mm x 95mm	221-48335-01	22286	22287	—
 <b>Double Gooseneck Splitless</b>	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.

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)	trace, active samples, high recovery & linearity	3.5mm 5.0mm x 95mm	—	21287	21288	—
 Gooseneck Drilled Uniliner (hole near top)	trace, active samples, high recovery & linearity	3.5mm 5.0mm x 95mm	—	21289	21290	—
 Gooseneck Drilled Uniliner (hole near bottom)	trace, active samples, high recovery & linearity	3.5mm 5.0mm x 95mm	—	21291	21292	—

\*Nominal ID at syringe needle expulsion point.



# 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.			BTO Septa usable to 400°C inlet temp.		
qty.	cat.#	price	qty.	cat.#	price	qty.	cat.#	price
25-pk.	27153		50-pk.	27170		50-pk.	27118	
50-pk.	27154		100-pk.	27171		100-pk.	27119	
100-pk.	27155							



22079

## 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	



21895

## 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	



← slot

22688

## 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	



← no slot

20375

## Restek Enhanced Capillary Nut

for Shimadzu 17A, 2010, and 2014 GCs

- Restek's design eliminates the slot, increasing lifetime and durability.
- Meets or exceeds original manufacturer's performance.

Description	Similar to Shimadzu part #	qty.	cat.#	price
Restek Enhanced Capillary Nut for Shimadzu 17A, 2010, and 2014 GCs	221-41533-00	2-pk.	20375	



21121

## 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	



24829

## 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 ends.
- Made from high-quality stainless steel.
- For use with graphite ferrules.

Description	qty.	cat.#	price
Capillary Installation Gauge for Shimadzu 17A, 2010, and 2014 GCs	ea.	22333	



**MLE**  
 Make Life Easier!

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	—
<b>Laminar Cup Splitter</b>						
	dirty samples, many injections before cleaning required	4.0mm 5.4mm x 79.5mm	—	20817	20818	—
<b>Cyclosplitter</b>						
	high & low MW compounds	4.0mm 5.4mm x 79.5mm	—	20885	20886	—
<b>Cup Splitter Gooseneck</b>						
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
<b>Splitless (2mm ID)</b>						
	trace samples	4.0mm 5.4mm x 79.5mm	—	20814	20815	20816
<b>Splitless (4mm ID)</b>						
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	—
<b>Open-top Uniliner w/Wool</b>						
Split 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.
	purge & trap & fast GC	1.0mm 8.0mm x 105mm	453 20075	20916	20917	—
<b>1mm Split</b>						
	universal	3.0mm 8.0mm x 105mm	453 20031	20936	20937	20938
<b>3mm Split</b>						
	universal	5.0mm 8.0mm x 105mm	453 20030	20939	20940	20941
<b>5mm Split</b>						
	high MW compounds	4.0mm 8.0mm x 105mm	—	20948	20949	—
<b>Laminar Cup Splitter</b>						
	high & low MW compounds	4.0mm 8.0mm x 105mm	—	20950	20951	—
<b>Cup Splitter</b>						
	dirty samples, trace samples	5.0mm 8.0mm x 105mm	—	22288	22289	—
<b>5mm Split Precision Liner w/Wool</b>						
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
<b>Splitless (3mm ID)</b>						
	trace samples	5.0mm 8.0mm x 105mm	453 20033	20945	20946	20947
<b>Splitless (5mm ID)</b>						
	trace, active samples up to 4µL	4.0mm 8.0mm x 105mm	—	20952	20953	—
<b>Double Gooseneck</b>						
	dirty samples, trace samples	5.0mm 8.0mm x 105mm	—	21028	21029	—
<b>5mm Splitless Precision Liner w/Wool</b>						

\*Nominal ID at syringe needle expulsion point.

All liners are  
**100%**  
deactivatedAll liners are shipped intermediate  
polarity (IP) deactivated unless  
otherwise requested.

## Supplies for Thermo Scientific GCs: Liners

COLUMN INSTALLS THIS END

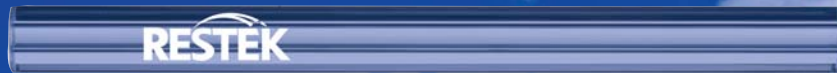
Split Liners for Thermo Scientific TRACE PTV	Benefits/Uses:	ID* OD x Length	Similar to TS part #	ea.	cat.#/price 5-pk.	25-pk.
 <b>1mm ID Glass Liner</b>	trace samples, high recovery & linearity	1.0mm 2.75mm x 120mm	453 22054	21114	21115	—
 <b>2mm ID Glass Liner</b>	universal	2.0mm 2.75mm x 120mm	453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

\*Nominal ID at syringe needle expulsion point.

# 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 &amp; 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	

Precision molded!

**Septa (9.5 mm, 17 mm)**

for Thermo Scientific GCs

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

Septum Diameter	25-pk./price	50-pk./price	100-pk./price
<b>BTO Septa</b> (usable to 400°C inlet temp.)			
9mm CenterGuide	—	27104	27105
9.5mm (3/8")	—	27106	27107
17mm CenterGuide	—	27116	27117

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

**HANDY**  
septum  
size chart

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

**Septum Cap**

for Split/Splitless Injector on Thermo Scientific TRACE, 8000, 8000 TOP &amp; 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	



21299



24972

**Septa Holder Kits**

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

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

Description	Similar to TS part #	qty.	cat.#	price
Septa Holder for Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL	233 030 15, 350 054 335	kit	21299	
Silcosteel-AC Treated Septa Holder for Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL	233 030 15, 350 054 33	kit	24972	

**Gold-Plated Liner Cap**

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



22089

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	

**Silver Seals**

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



23057

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



## 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.



**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
<b>For use with standard 1/8" ferrules.</b>				
Adaptor for Capillary Column on Detector Base		ea.	24916	
Adaptor for Capillary Column on Split/Splitless Injector		ea.	24917	
Siltek Treated Adaptor for Capillary Column on Split/Splitless Injector		ea.	20543	
<b>For use with M4 ferrules.</b>				
Adaptor for Capillary Column on Detector Base	347 25 436	2-pk.	24969	
Adaptor for Capillary Column on Split/Splitless Injector	347 05 451	ea.	24970	
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 &amp; 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 performance.



Description	Similar to TS part #	qty.	cat.#	price
FID Jet for Thermo Scientific TRACE and Focus GCs	404 043 01	ea.	23080	

**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 page204.**[www.restek.com/leakdetector](http://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	Similar to TS part #	qty.	cat.#	price
Liner Cap Removing Tool for Thermo Scientific GCs	205 070 10	ea.	24937	



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	



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	



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 downtime to a minimum.

Electron Multiplier for Thermo Scientific GC/MS	qty.	cat.#	price
For Thermo TRACE DSQ, DSQII, and Polaris-Q GC/MS	ea.	23081	

Other ETP Electron Multipliers are available upon request. Call us 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 mm<sup>2</sup> compared to a standard continuous dynode multiplier that only has a total channel surface area of around 106 mm<sup>2</sup>. 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

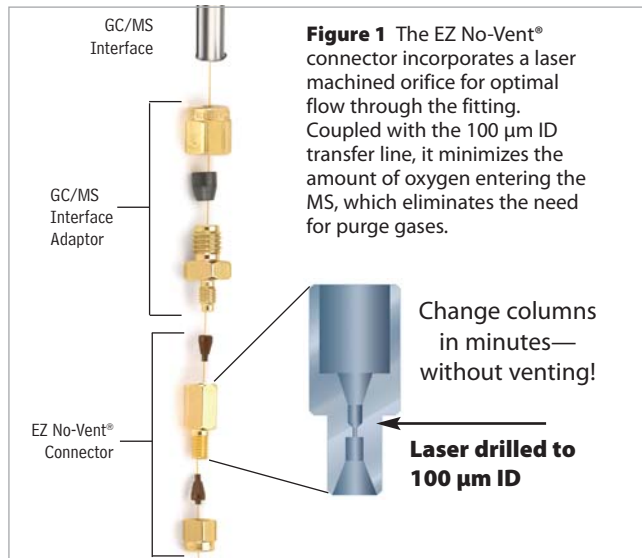
for Thermo Scientific Focus DSQ GC Mass Spectrometers

- 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® connector easily attaches to the MS source without special tools or extra plumbing.



Description	qty.	cat.#	price
<b>EZ No-Vent Connector Kit</b> 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.
		trace samples <2µL	2.0mm 6.3mm x 74mm	190010905	20721	20722	20723
<b>2mm Splitless</b>							
		trace samples >2µL	4.0mm 6.3mm x 74mm	—	20904	20905	20906
<b>4mm Splitless</b>							
		trace, active samples up to 4µL	4.0mm 6.3mm x 74mm	—	20847	20848	20849
<b>Double Gooseneck</b>							
		trace, dirty, active samples up to 4µL	4.0mm 6.3mm x 74mm	—	20897	20898	—
<b>Cyclo Double Gooseneck</b>							
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.
		purge & trap inlet splitting or samples <1µL	1.0mm 6.3mm x 72mm	—	20970	20971	—
<b>1mm Split</b>							
		universal, use with rapid autosamplers	4.0mm 6.3mm x 72mm	190010901	20792	20793	20794
<b>Splitter w/Wool</b>							
		high MW compounds	4.0mm 6.3mm x 72mm	190010902	20803	20804	—
<b>Laminar Cup Splitter</b>							
		high & low MW compounds	4.0mm 6.3mm x 72mm	—	20724	20725	—
<b>Cup Splitter</b>							
		dirty samples, many injections before cleaning required	4.0mm 6.3mm x 72mm	—	20727 \$55	20728	—
<b>Cyclo splitter</b>							
		dirty samples, non-active compounds	4.0mm 6.3mm x 72mm	190010903	20715	20716	20717
<b>Frit Splitter</b>							
		compounds with close boiling points	4.0mm 6.3mm x 72mm	190010904	20718	20719	20720
<b>Baffle Splitter</b>							
		dirty samples, active samples	4.0mm 6.3mm x 72mm	—	21030	21031	—
<b>Split Precision Liner w/Wool</b>							
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.
		trace, active samples, high recovery & linearity	4.0mm 6.3mm x 72mm	—	20345	20346	—
<b>Uniliner</b>							
		trace, dirty, high MW, active samples, linearity	4.0mm 6.3mm x 72mm	—	20347	20348	—
<b>Cyclo-Uniliner</b>							
		trace, dirty, active samples, high recovery & linearity	4.0mm 6.3mm x 72mm	—	20845	20846	—
<b>Open-top Uniliner w/Wool</b>							
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.
		ideal for low-volume SPME applications	0.75mm 6.3mm x 74mm	—	21112	21113	—
<b>SPME Liner</b>							

\*Nominal ID at syringe needle expulsion point.




All liners are  
**100%**  
deactivated









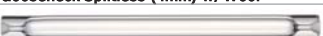
All liners are shipped intermediate polarity (IP) deactivated unless otherwise requested.







COLUMN INSTALLS THIS END

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.
 <b>0.5mm SPI</b>	high linearity for 0.25 & 0.32mm ID columns	0.53mm 4.6mm x 54mm	190010906	20775	20776	20777
 <b>0.8mm SPI</b>	high linearity for 0.53mm ID columns	0.80mm 4.6mm x 54mm	190010907	20778	20779	20780
 <b>SPI with Buffer</b>	dirty samples >1μL, fits 0.25, 0.32 & 0.53mm ID columns	2.4mm 4.6mm x 54mm	190010908	20850	20851	20852





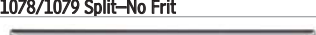

Liners for Varian 1177 S/SL Injection Ports	Benefits/Uses:	ID* OD x Length	Similar to Varian part #	ea.	cat.#/price 5-pk.	25-pk.
 <b>4mm Split w/Glass Frit</b>	universal	4.0mm 6.3mm x 78.5mm	—	21045	21046	—
 <b>4mm Split w/Wool</b>	universal, use with Agilent 7673 autosampler	4.0mm 6.3mm x 78.5mm	392611934	—	21079	—
 <b>4mm Split Precision Liner w/Wool</b>	dirty samples, trace samples	4.0mm 6.3mm x 78.5mm	—	20759	20762	—
 <b>Low Pressure Drop Precision Liner w/Wool</b>	trace samples <2μL, dirty samples	2.0mm 6.3mm x 78.5mm	—	22421	22422	—
 <b>Laminar Cup Splitter</b>	high MW compounds	4.0mm 6.3mm x 78.5mm	—	20765	20768	—
 <b>2mm Splitless w/Wool</b>	trace samples <2μL	2.0mm 6.5mm x 78.5mm	392599903	—	21077	—
 <b>Gooseneck Splitless (4mm)</b>	trace samples <2μL	4.0mm 6.5mm x 78.5mm	392611927	21896	21897	—
 <b>Gooseneck Splitless (4mm) w/Wool</b>	trace samples <2μL	4.0mm 6.5mm x 78.5mm	392611928	21896-200.1	21897-200.5	—
 <b>Double Gooseneck Splitless (4mm)</b>	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.
 <b>Drilled Uniliner (hole near top)</b>	trace, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm	—	21470	21471
 <b>Drilled Uniliner (hole near bottom)</b>	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.

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)	trace, active samples, high recovery & linearity	3.5mm 5.0mm x 54mm	—	22280	22281

\*Nominal ID at syringe needle expulsion point.

## i tech tip

### Drilled Uniliner® Liners

Use the Drilled Uniliner® liner with the hole near the bottom for semivolatile 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

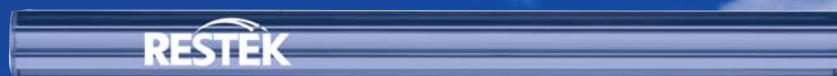
- Won't crack, chip, or break like glass liners.
- Excellent response for pesticides, phenols, and other active compounds.

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



**Sky**  
Inlet Liners

Introducing **Sky™** Liners



See page 206 for more details.

**RESTEK**

**CHROMALYTIC** +61(0)3 9762 2034  
ECHnology Pty Ltd

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

11/12

www.restek.com

**261**

## 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		392611919,			
for Varian 1078/1079 GCs	450°C	392534201	10-pk.	22683	



## 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
<b>Thermolite Septa</b> (usable to 340°C inlet temp.)			
9mm	27132	27133	27134
9.5mm (7/16")	27135	27136	27137
10mm	27138	27139	27140
11mm (7/16")	27141	27142	27143

<b>IceBlue Septa</b> (usable to 250°C inlet temp.)			
9mm	—	27156	27157
9.5mm (7/16")	—	27158	27159
10mm	—	27160	27161
11mm (7/16")	—	27162	27163

<b>BTO Septa</b> (usable to 400°C inlet temp.)			
9mm CenterGuide	—	27104	27105
9.5mm (7/16")	—	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.



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, 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.





20881

### 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	



21690

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

Siltek® treated to eliminate sample adsorption.

Description	Similar to Varian part #	qty.	cat.#	price
Siltek Treated Inlet Support Springs for Varian 1075/1077 Split Injectors	03-949786-00	3-pk.	21690	



22335

### 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!



22184

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

#### Includes:

- capillary installation gauge for Varian 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 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
- 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	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!

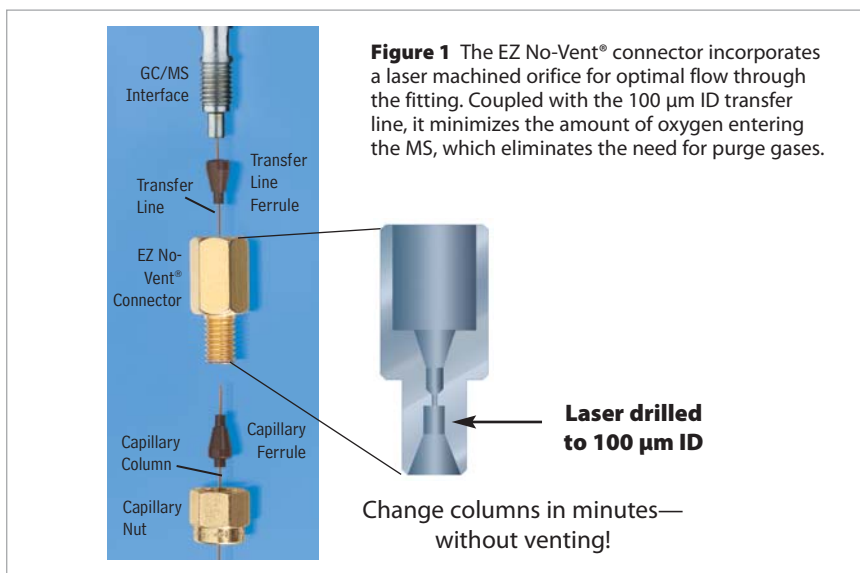
Kit installs easily,  
without special tools  
or plumbing.



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

- Change GC/MS columns in minutes without venting—100  $\mu$ 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.



Description	qty.	cat.#	price
<b>EZ No-Vent Connector Kit for Varian Saturn 2000 Series MSs</b>			
Includes: EZ No-Vent Connector, two 0.4mm ID adaptor ferrules for capillary column, two 0.4mm ID ferrules for transfer line, 100 $\mu$ 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 $\mu$ 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 Conversion

- Visually observe the Press-Tight® connection between the 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

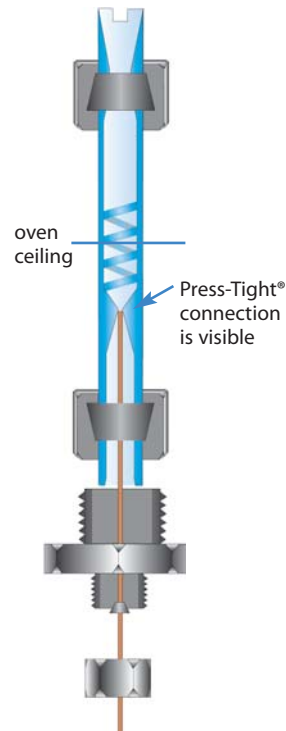
Includes a 1/4-inch stainless steel nut and graphite ferrule for attaching the liner to the GC inlet and a 1/4 to 1/16-inch stainless steel reducer, plus a 1/4-inch and 0.5 mm ID graphite ferrule for attaching the column to the liner.

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

## it's a fact

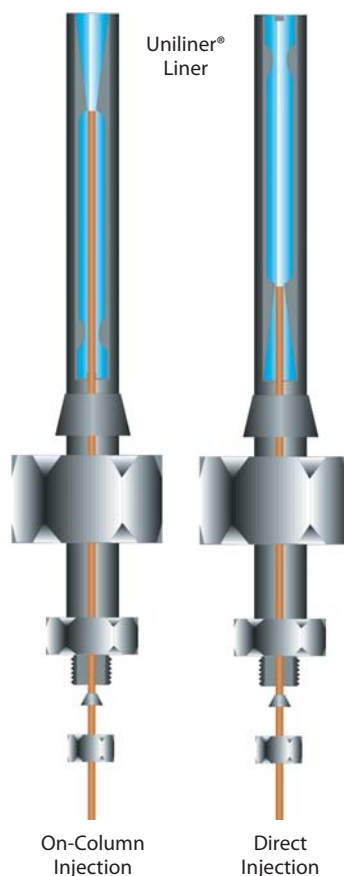
### Vu-Tight Inlet Liners

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.



## 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
<b>Uniliner Liner</b> (small buffer volume chamber 60mm long, for injections $\leq 2\mu\text{L}$ )	0.53mm DI or OC	20902	20903
<b>Uniliner Liner</b> (large buffer volume chamber 85mm long, for injections $\leq 4\mu\text{L}$ )	0.32 & 0.53mm DI only	20308	20309
	0.53mm DI or OC	20301	20305
<b>Cyclo-Uniliner Liner</b> (for active, dirty samples)	0.32 & 0.53mm DI only	20319	20320
<b>Open-Top Uniliner Liner</b> (packed with wool)	0.32 & 0.53mm DI only	20315	20316
<b>Low Volume/Purge &amp; Trap Uniliner Liner</b> (1mm ID x 5mm OD: use in 1/4" injection ports to troubleshoot purge & trap units)	0.32 & 0.53mm DI only	20307	20314

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

### Uniliner Liner Adaptor

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



	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.





# Introducing Sky™ Liners



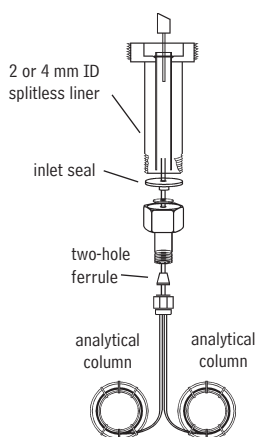
See page 206 for more details.



## Dual Column Analysis: Which technique is right for you?

**Split/Splitless Injection**

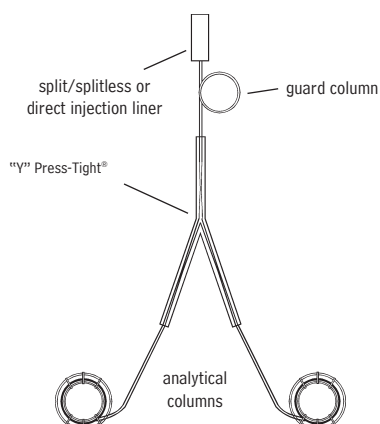
Two-hole ferrules allow dual-column confirmational analysis in the same split/splitless inlet.



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 fittings (cat. # 20645) to allow both columns to fit side by side in the injector. Use either straight or extended gooseneck split/splitless liners.

**Split/Splitless or Direct Injection**

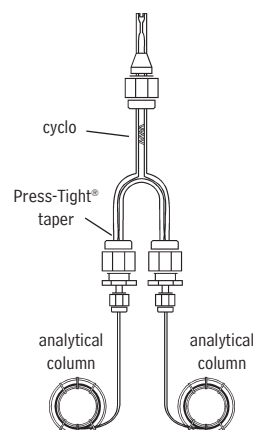
The "Y" Press-Tight® configuration allows dual columns to be used in either a split/splitless or direct injection inlet.



The "Y" Press-Tight® configuration offers versatility because it allows any diameter column or guard column to be connected to a split/splitless or direct injection liner.

**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 the sample onto two columns. The dual sealing mechanisms increase ease of use and confidence in the connection relative to the "Y" Press-Tight® configuration.

Analyzing the same sample on two columns of different polarity can increase both qualitative and quantitative reliability. However, having to repeat the analysis on a second column will significantly reduce sample throughput. The simple solution to improving analytical reliability without reducing sample throughput is to use a simultaneous dual-column technique. 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	

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

- 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.



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	

**Graphite Replacement Ferrules**

ID	fitting 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	

**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	



20645

**1/8-Inch Capillary Inlet Adaptor Fitting Kit**

(Split/splitless fitting for 0.53 mm 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	

**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).



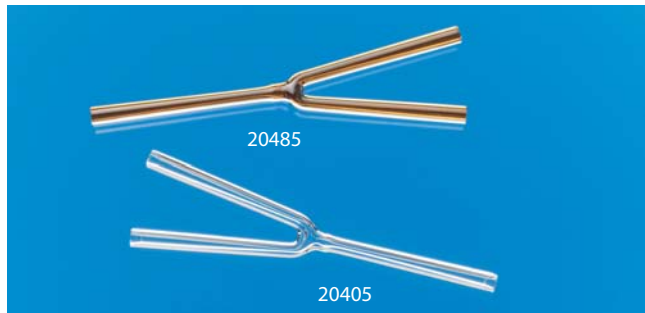
Fitting Size	Ferrule ID	Fits Column ID	qty.	Vespel/Graphite
1/16"	0.4mm	0.25/0.28mm	5-pk.	24848
1/16"	0.5mm	0.32mm	5-pk.	24849
1/8"	0.8mm	0.45/0.53mm	5-pk.	20246

**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).

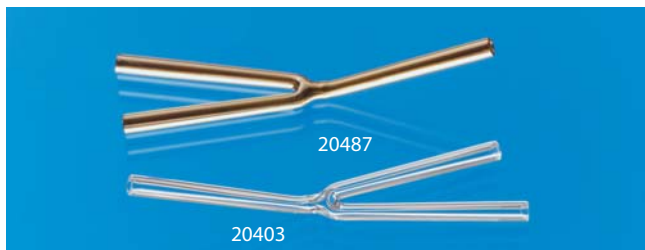


### Universal “Y” Press-Tight® Connectors

An alternative method of performing dual-column confirmational analyses!

- Split sample flow onto two columns.
- Split a single column flow to two detectors—perform confirmation analysis with a single injection.

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



### Universal Angled “Y” Press-Tight® Connectors

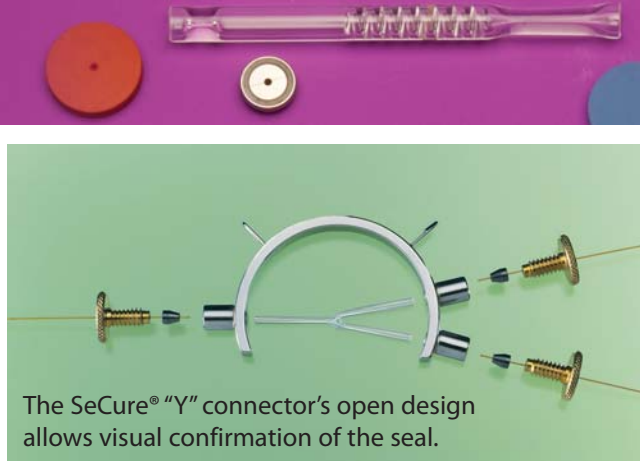
- Perform confirmation analysis with a single injection.
- Made from inert fused silica.
- Inlet and outlet ends conform to the column curvature—alleviates column-end connection strain.

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	



### 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 unexpectedly disconnecting, even at temperatures as high as 400 °C.

Kits include: SeCure® “Y” connector body, 3 knurled nuts, “Y” Universal Press-Tight® union, 3 ferrules.

Description	Ferrules Fit Column ID	qty.	cat.#	price
SeCure “Y” Connector Kit	0.18/0.25/0.28mm	kit	20276	
SeCure “Y” Connector Kit	0.32mm	kit	20277	
SeCure “Y” Connector Kit	0.45/0.53mm	kit	20278	
Knurled nut		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 nut mounts nickel reaction tube into ELCD.



Description	qty.	cat. #	price
ELCD Nickel Reaction Tube Nut	2-pk.	21584	

## 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	qty.	cat. #	price
1/16-Inch Sealing Ring, Vespel/Graphite	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	qty.	cat. #	price
Teflon Transfer Lines for ELCDs, 1/16" OD x 0.020" ID (five 6.5-inch lines)	5-pk.	20121	

## Antifoam Agent for Purge &amp; 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
<b>Fritted Spargers</b>				
Fritted, 1/2-inch mount	5mL	ea.	21150	
Fritted, 1/2-inch mount	10mL	ea.	26138	
Fritted, 1/2-inch mount	25mL	ea.	21151	
<b>Non-Fritted Spargers</b>				
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

- Increase response for ketones, alcohols, and acetates.
- Silcosteel®-deactivated tubing for increased inertness.
- Suitable for US EPA Methods 8260, 524.2, and OLM4.1.
- Easily attaches in minutes.

Description	qty.	cat. #	price
Moisture Control By-Pass Line for Tekmar 3000	ea.	21035	
Moisture Control By-Pass Line for Tekmar 3100	ea.	21109	



## 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	

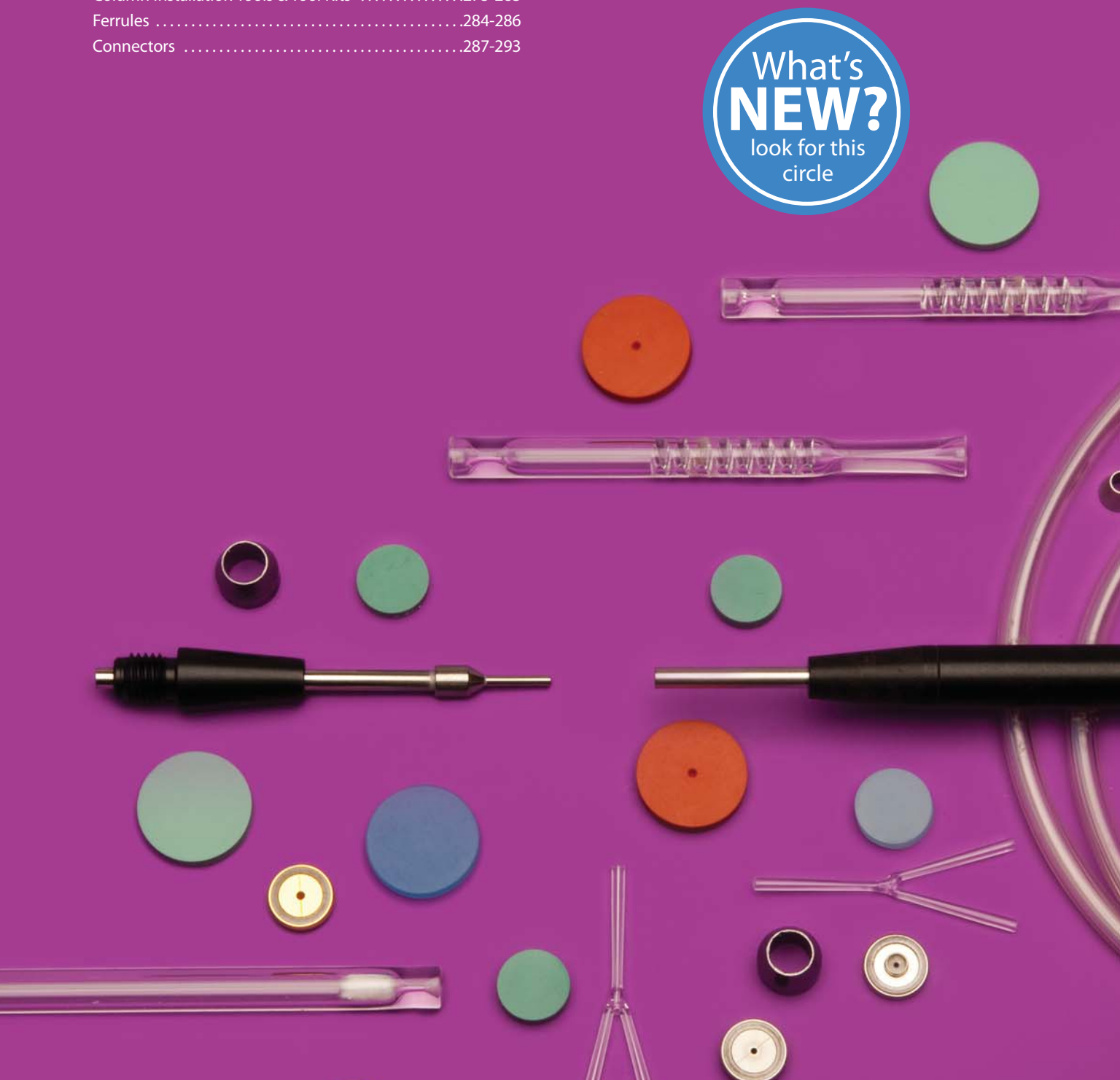


# GC ACCESSORIES

## 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



**RESTEK**

**HROMalytic**  
**ECH**nology Pty Ltd

+61(0)3 9762 2034

Australian Distributors  
Importers & Manufacturers  
[www.chromtech.net.au](http://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 Restek Electronic Leak Detector at the following leak rates.

Gas	Minimum Detectable Leak Rate (atm cc/sec.)	Indicating LED Light Color
Helium	$1.0 \times 10^{-5}$	Red
Hydrogen*	$1.0 \times 10^{-5}$	Red
Nitrogen	$1.4 \times 10^{-3}$	Yellow
Argon	$1.0 \times 10^{-4}$	Yellow
Carbon Dioxide	$1.0 \times 10^{-4}$	Yellow

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.

**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](http://www.restek.com/cat001)



22839



22839

Hard-sided carrying case included 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

**i tech tip**

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

**RESTEK**

**CHROMALYTIC** +61(0)3 9762 2034  
ECHnology Pty Ltd

Australian Distributors  
Importers & Manufacturers  
[www.chromtech.net.au](http://www.chromtech.net.au)

**11/12**[www.restek.com](http://www.restek.com) **273**

# Lab Gas Issues?

## RESTEK HAS THE SOLUTION!



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 continually changing gas types.

### 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  $\pm 0.2$  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	

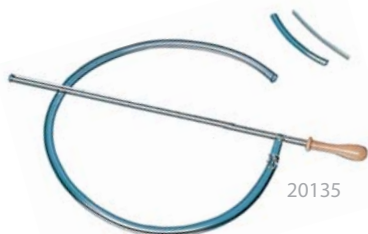
\*The flowmeter is designed to measure clean, dry, non-corrosive gases.

Go to [www.restek.com/flowmeter](http://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).





20135

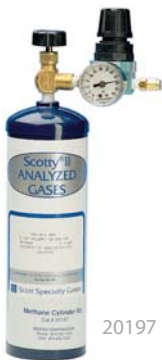
### Soap Film Bubble Flowmeter

- 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 (ASTM Method E1510-93). The kit includes a Scotty® 14 cylinder containing 1% methane in helium, a MINICYL regulator, a syringe adaptor, and a package of twenty-five septa for the adaptor.



20197

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 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	



21000

### 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.
- 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.



22181

#### 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.



22180



22179

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 and maintain capillary columns at a discounted price compared to buying the tools individually!



22183

## 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.



23015

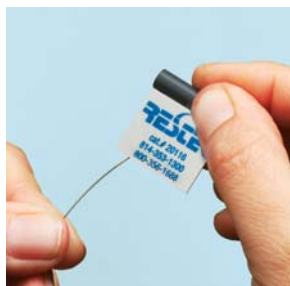
Description	qty.	cat. #	price
Scoring Wafer with Handle	2-pk.	23015	

**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	

**Shortix® Capillary GC Column Cutter**

- Consistently make precise, clean, square cuts with a diamond blade.
- Built-in magnifier to verify square cut.
- Use with 0.25 mm ID to 0.53 mm ID tubing (0.78 mm OD maximum).



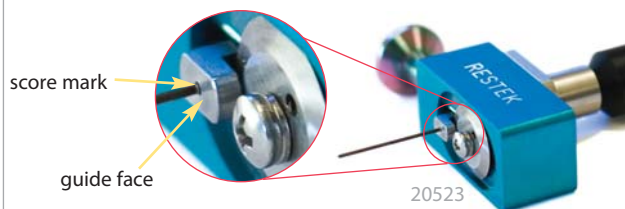
23027



23026

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

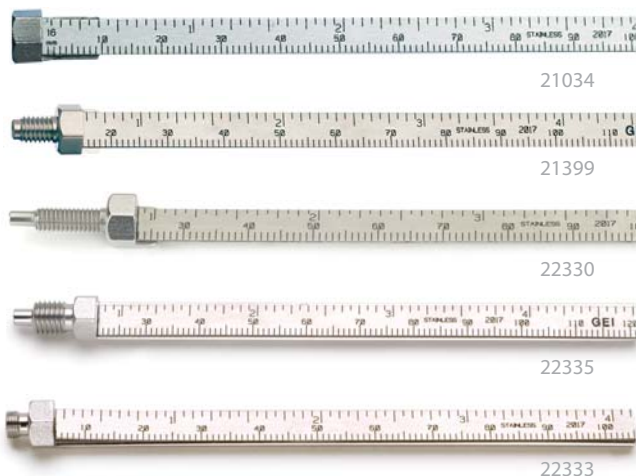
**Restek Tubing Scorer**

- 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	

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 gauge for Agilent-style fittings.



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



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.



### 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	G1099-20030	ea.	21894	



### 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.
- 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.



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.



20181



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 surfaces.

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



20339

### 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.

### Eliminates user variation!

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

### No more burned fingers!



26262

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	



20114

### 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  
Inlet Liners **Sky™ Liners**

RESTEK

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 fittings (Agilent split/splitless injection ports)	ea.	23018	
Rethreading Tool for $7/16"$ compression fitting (Varian injection ports)	ea.	23019	
Rethreading Tool for $1/4"$ Varian-style capillary column fittings	ea.	21893	

**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 tightening a wide variety of 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 5/16".

Description	qty.	cat.#	price
12 Piece Ball-Point Hex Key Set	set	22998	

**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	



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	



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 brush can be used to remove residue that builds up on metal detector jets and electronic contacts.

Description	qty.	cat.#	price
Stainless Steel Tube Brushes/Surface Brush	4-piece set	20112	



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	



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	

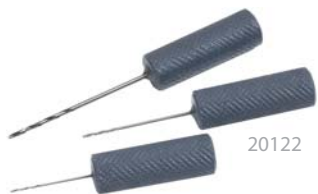


21601

#### 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	



20122

#### Mini Hand Drill Set

Drill ferrules to the proper ID in seconds! Includes three drills, for use with 0.25, 0.32, and 0.53 mm ID (0.4, 0.5, and 0.8 mm OD) capillary columns.

Description	qty.	cat.#	price
Mini Hand Drill Set	3-piece set	20122	



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	

#### 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.

Description	qty.	cat.#	price
GC Oven Thermometer	ea.	22066	



22066

#### Flashlight with Swivel Head

- Ideal for tight spaces—like inside a GC oven.
- Uses two AA batteries (included).



22187

Description	qty.	cat.#	price
Flashlight with Swivel Head	ea.	22187	

#### 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.

restek  
innovation!



24918



Slip tool over septum nut...



loosen nut...



and remove, avoiding hot metal surfaces.



Septum nut remains in tool until reinstalled.

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

### 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.

Description	Similar to TS part #	qty.	cat.#	price
Liner Cap Removing Tool for Thermo Scientific GCs	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

[www.restek.com/quechers](http://www.restek.com/quechers)



## 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.



graphite ferrules



graphite ferrules



graphite ferrules

### 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.

Ferrule ID	Fits Column ID	qty.	Vespal	Graphite	Vespal/Graphite
0.3mm		10-pk.	22213	20233	20275
0.4mm	0.10/0.15/0.18/0.25/0.28mm	10-pk.	22214	20200	20211
0.4mm	0.10/0.15/0.18/0.25/0.28mm	50-pk.	—	20227	20229
0.5mm	0.32mm	10-pk.	22215	20201	20212
0.5mm	0.32mm	50-pk.	—	20228	20231
0.6mm	0.28mm**	10-pk.	—	—	20232
0.8mm	0.45/0.53mm	10-pk.	22216	20202	20213
0.8mm	0.45/0.53mm	50-pk.	—	20224	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.

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.

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	0.25mm	5-pk.	20205	20254
$1/8$ "	0.5mm	0.32mm	5-pk.	20205	20255
$1/8$ "	0.8mm	0.53mm	5-pk.	20206	20215
$1/4$ "	0.4mm	0.25mm	5-pk.	20203	—
$1/4$ "	0.5mm	0.32mm	5-pk.	20203	20257
$1/4$ "	0.8mm	0.45/0.53mm	5-pk.	20204	20217

**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 &amp; 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
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

**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	

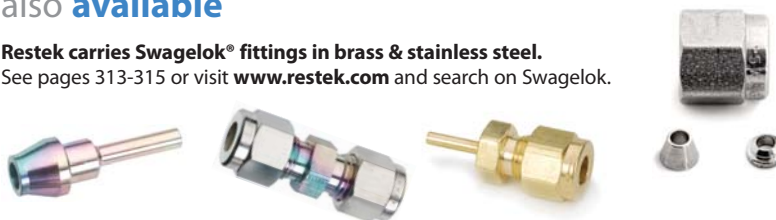
**Graphite Ferrules**

for Shimadzu 17A, 2010, &amp; 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	

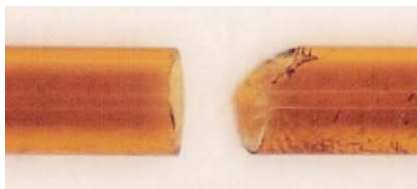
## also available

**Restek carries Swagelok® fittings in brass & stainless steel.**See pages 313-315 or visit [www.restek.com](http://www.restek.com) and search on Swagelok.

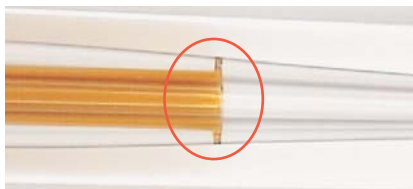
**Restek Press-Tight® Connectors**

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, then establish a flow, and leak-check the seal with a Restek Electronic Leak Detector (cat.# 22839, page 273) before heating the system. The seal is made permanent as the polyimide resin coating on the column bonds to the inner surface of the connector after several thermal cycles to 200 °C.

**What is the maximum temperature for a Press-Tight® connector?**

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.

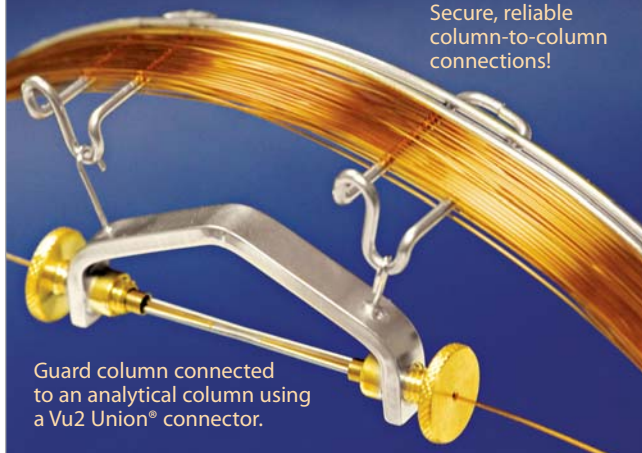
**Can Press-Tight® connectors be used with MXT® columns?**

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.

**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.

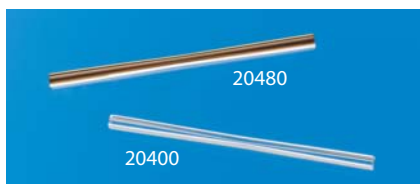
\*Additional cost will be added to the price of the column.





### 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.

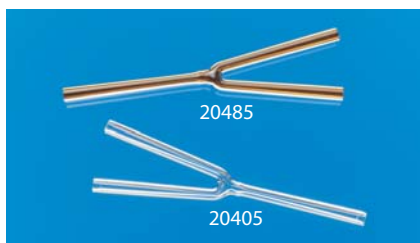
Description	5-pk./price	25-pk./price	100-pk./price
Universal Press-Tight Connectors	20400	20401	20402
Universal Press-Tight Connectors, Deactivated	20429	20430	
Universal Press-Tight Connectors, Siltek Treated	20480	20449	



### 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
Universal Angled Press-Tight Connectors	20446	20447	20448
Universal Angled Press-Tight Connectors, Deactivated	20446-261	20447-261	20448-261
Universal Angled Press-Tight Connectors, Siltek Treated	20482	20483	20484



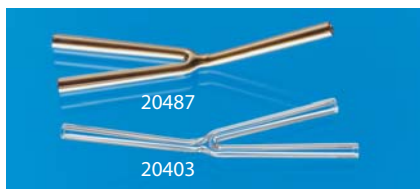
### Universal “Y” Press-Tight® Connectors

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.

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

Single injection confirmational analyses!



### 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.

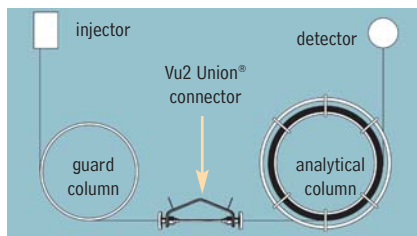
Description	Max. Temp.	qty.	cat.#	price
Polyimide Resin	350°C	5 grams	20445	

**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.



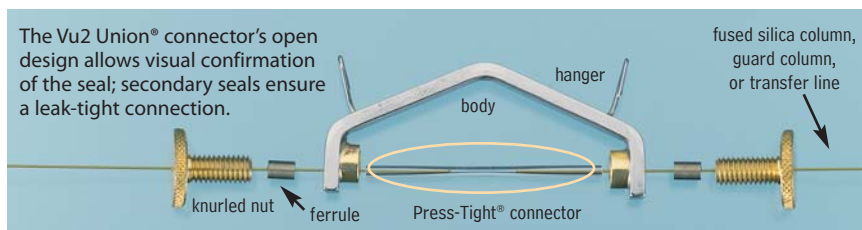
Patent pending.

**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 connected in series, or seeking to repair a broken column will find Vu2 Union® connectors the simple, reliable, easy-to-use solution to their connection needs.



Secure, reliable  
column-to-column  
connections!

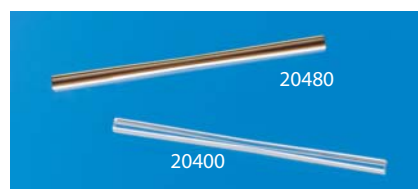
NOTE: This product is not recommended for GC column-to-MS connections—use the Vacuum Vu-Union®. See page 291.

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



restek  
innovation!



Fit both Restek cage designs.



Patent pending.

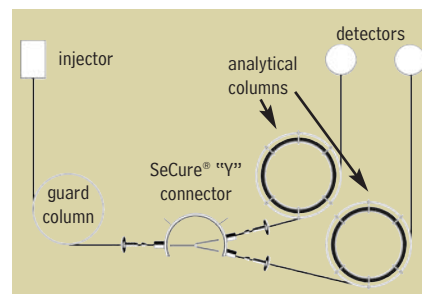
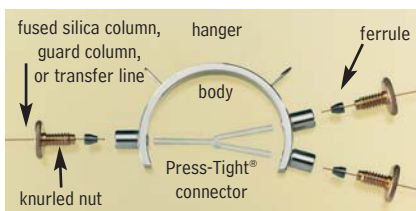
### SeCure® "Y" Connector Kits

- 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.



Secure, reliable  
column-to-column  
connections!

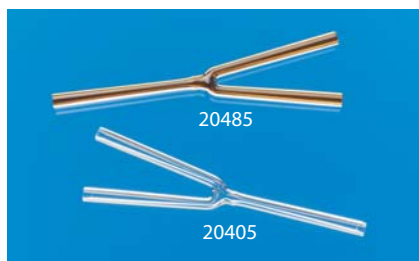
Kits include: SeCure® "Y" connector body, 3 knurled nuts, "Y" Universal Press-Tight® union, 3 ferrules.

Description	Ferrules Fit Column ID	qty.	cat.#	price
SeCure "Y" Connector Kit	0.18/0.25/0.28mm	kit	20276	
SeCure "Y" Connector Kit	0.32mm	kit	20277	
SeCure "Y" Connector Kit	0.45/0.53mm	kit	20278	
Knurled nut		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	qty.	cat.#	price
Vacuum Vu-Union Connector (with the Helping Hand)	ea.	20427	
Replacement Inserts	3-pk.	20428	



20422

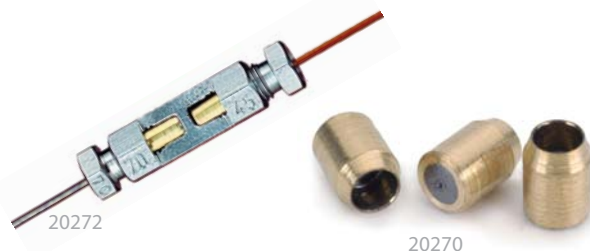
**Vu-Union® Vespel®/Graphite Ferrules**

- 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	

**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).



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	

\*Use only with GRAPHPACK 3D/2 ferrules.

**GRAPHPACK® 2m Ferrules**

Fits Column ID	Similar to Gerstel part #	qty.	cat.#	price
0.25mm	001805-040-00	10-pk.	22223	
0.32mm	001805-045-00	10-pk.	22224	
0.53mm	001805-007-00	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	



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	qty.	cat.#	price
For 0.25mm ID Fused Silica Columns	kit	21386	
For 0.32mm ID Fused Silica Columns	kit	21385	
For 0.53mm ID Fused Silica Columns	kit	21384	

### MXT® “Y”-Union Connector Kits 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	
1/16" 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	
For 0.32mm ID MXT Columns	kit	20536	
For 0.53mm ID MXT Columns	kit	20394	

### MXT® Low-Dead-Volume “Y” Connector Kits for Metal Columns

Connect two MXT® columns to one inlet or one MXT® column 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	Valco #	qty.	cat.#	price
Internal Reducing Union	0.25mm	ZRU21C	ea.	20151	
Internal Reducing Union	0.75mm	ZRU21	ea.	20152	
Internal Reducing Union	1/16"	ZRU21T	ea.	20153	



### 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	



### Nuts & Ferrules (1/16-Inch Stainless Steel) for Valco® Connectors

Description	Valco #	qty.	cat.#	price
Ferrules, 1/16" Stainless Steel	ZF1-10	10-pk.	20286	
Nuts, 1/16" Stainless Steel	ZN1-10	10-pk.	20287	



### 1/16-Inch Valco® Adaptor Ferrules

Tubing OD	Tubing ID	Valco #	qty.	Valcon Polyimide		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®/Sulfinit® 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
Gas Generators .....	304-308
Gas Regulators & Accessories .....	309-312
Fittings .....	313-317
Tubing & Valves .....	318-322
VCO Fittings .....	322
Installation Tools .....	323
Tubing & Fitting Tools .....	324-325

What's  
**NEW?**  
look for this  
circle



**RESTEK**

**HRMalytic**  
**ECH**nology Pty Ltd

+61(0)3 9762 2034

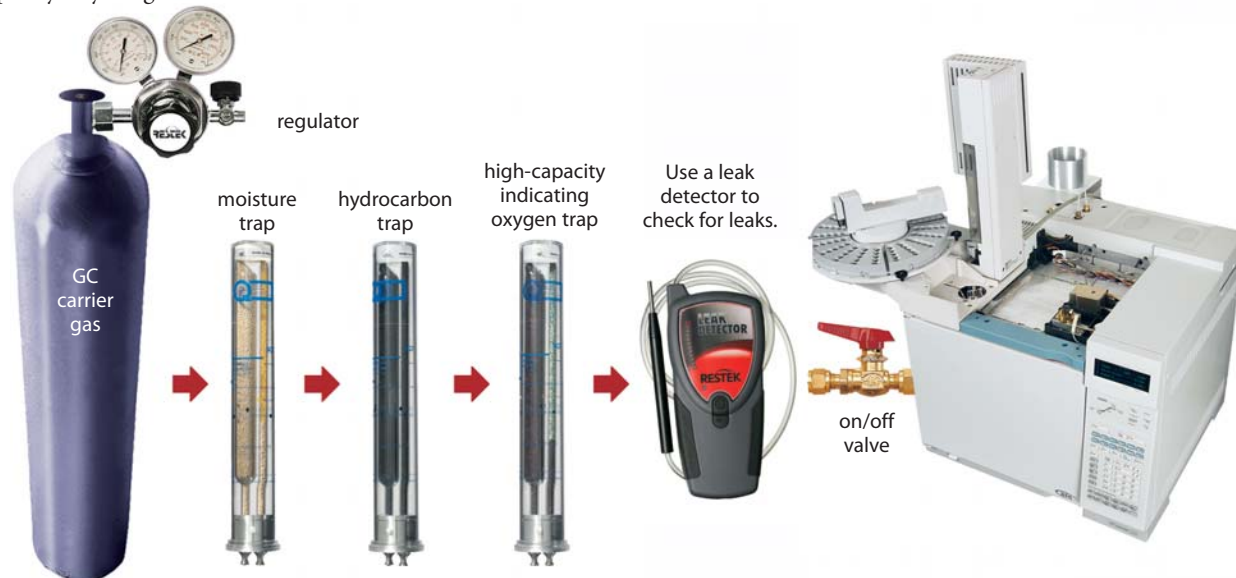
Australian Distributors  
Importers & Manufacturers  
[www.chromtech.net.au](http://www.chromtech.net.au)

11/12

### 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



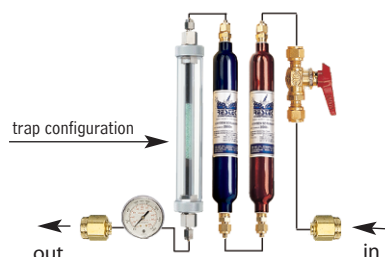


Dimensions:  
 12" x 14" x 3"  
 (30.5 x 35.6 x 7.6 cm)

### 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.

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.

Description	Fittings	qty.	cat.#	price
Restek Gas Management System	includes fittings for 1/8" and 1/4" gas line	kit	21999	
Replacement Traps		qty.	cat.#	price
High-Capacity Moisture Trap	1/8" Nickel-Plated Brass	ea.	21997	
Capillary-Grade Hydrocarbon Trap	1/8" Nickel-Plated Brass	ea.	21991	
Indicating Oxygen Trap	1/8" Nickel-Plated Brass	ea.	22010	

### 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.

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



22839



#### 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.



22658

### 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)		kit	22081	



Dimensions: 10" x 1 1/4" (25.4 x 3.2 cm)

### 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  $\mu$ 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 ft<sup>3</sup> 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.
- Maximum operating pressure: 250 psi (1,724 kPa).
- Maximum flow: 1.25 L/min.

Description	Fittings	qty.	cat.#	price
High-Capacity Moisture Trap	1/8" Nickel-Plated Brass	ea.	21997	
High-Capacity Moisture Trap	1/4" Nickel-Plated Brass	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  $\mu$ 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 1 1/2" (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	1/8" Nickel-Plated Brass	ea.	21991	
Capillary-Grade Hydrocarbon Trap	1/4" Nickel-Plated Brass	ea.	21992	



Dimensions: 9 1/4" x 2 1/4" (23.5 x 5.7 cm)

**Refillable Hydrocarbon Trap**

- Removes trace impurities from carrier gas.
- Reduces organics to 0.1 ppm (assuming 100 ppm input).
- 60 µm frit prevents gas contamination by purifier particles.
- Good for purge & trap systems.
- Refillable and rechargeable.
- Maximum operating pressure: 125 psig (862 kPa).
- Maximum flow: 5 L/min.

Description	Fittings	qty.	cat.#	price
Refillable Hydrocarbon Trap	1/8" Nickel-Plated Brass	ea.	22012	
Refillable Hydrocarbon Trap	1/4" 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: 6 3/4" x 5 5/8" (17.1 x 14.3 cm)

Description	Fittings	qty.	cat.#	price
Hydrocarbon S-Trap	1/8" Brass	ea.	22016	



Dimensions: 6" x 1 3/4" (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	1/8" Brass	ea.	20637	
Indicating Hydrocarbon Trap for Air Compressors	1/4" Brass	ea.	20636	



Dimensions: 6" x 1" (15.2 x 2.5 cm)

**High-Capacity Split Vent Trap**

- Reduces the release of hazardous materials from the capillary split vent into the lab.
- Includes connecting lines and mounting kit.

Description	Fittings	qty.	cat.#	price
High-Capacity Split Vent Trap	1/8"	ea.	20698	
High-Capacity Split Vent Trap	1/8"	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	1/8"	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.

**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 10<sup>5</sup>/<sub>8</sub>" x 1<sup>3</sup>/<sub>4</sub>" (27 x 4.4 cm).
- Each base plate unit measures 4" x 4" x 1<sup>7</sup>/<sub>8</sub>" (10.2 x 10.2 x 4.8 cm).

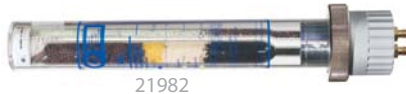
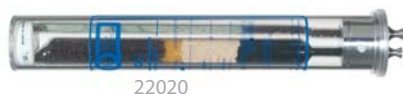
**Table I** Each Super-Clean gas filter provides high-purity outlet gas.

Type of Filter	Outlet Gas Quality (%)	Maximum Pressure/ Maximum Flow Rates	Use for:	Indicator Color Change	Capacity			Estimated Lifetime (years)
					H <sub>2</sub> O (g)	O <sub>2</sub> (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 <sup>1</sup>	> 2
Fuel Gas <sup>1</sup> cat.# 22022	> 99.9999	11 bar 159 psi/ 7 L/min.	Inert carrier gas Air Hydrogen	Yellow/orange to clear	3.5	—	24 <sup>3</sup>	> 1.5
Triple <sup>2</sup> 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 <sup>3</sup>	> 1
Helium Specific <sup>2</sup> cat.# 21982	> 99.9999	11 bar 159 psi/ 7 L/min.	Helium	Yellow/orange to clear Green to grey	1.8	500	—	> 1

<sup>1</sup>Removes hydrocarbons, moisture.<sup>2</sup>Removes hydrocarbons, moisture, oxygen.<sup>3</sup>As *n*-butane.

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.

**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.





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	

### Wall Mounting Bracket

Base plates can be mounted by using screws and the mounting holes on the base plate, or by 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	

### 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 (2-position base plate, 2 charcoal filters)	ea.	22062	
Replacement Hydrocarbon (Charcoal) Filters	2-pk.	22061	

also **available**

### 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](http://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,  $\frac{1}{4}$ " or  $\frac{1}{8}$ ".
- 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 <sub>2</sub> O (g)	Capacity O <sub>2</sub> (mL)	Hydrocarbons (g) (n-butane)	Estimated Lifetime (years)
Moisture cat.#22467	>99.9999	11 bar 160 psi	25	Inert carrier gas, helium, air, H <sub>2</sub>	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 <sub>2</sub>	NA	NA	24	>3
Fuel Gas <sup>1</sup> cat.#22465	>99.9999	11 bar 160 psi	25	Inert carrier gas, helium, air, H <sub>2</sub>	7	NA	12	>2
Triple <sup>2</sup> cat.#22464	>99.9999	11 bar 160 psi	25	Inert carrier gas	4	1,000	8	>2

<sup>1</sup>Removes hydrocarbons, moisture.

<sup>2</sup>Removes hydrocarbons, moisture, oxygen.

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:  
8½" x 1¼" (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
<b>Carrier Gas Purification Kit</b>			
Includes: (2) $\frac{1}{8}$ " SS connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22456	
Includes: (2) $\frac{1}{8}$ " brass connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22457	
Includes: (2) $\frac{1}{4}$ " SS connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22458	
Includes: (2) $\frac{1}{4}$ " brass connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22459	
<b>Fuel Gas Purification Kit</b>			
Includes: (4) $\frac{1}{8}$ " SS connectors and (2) hydrocarbon/moisture traps	kit	22460	
Includes: (4) $\frac{1}{8}$ " brass connectors and (2) hydrocarbon/moisture traps	kit	22461	
Includes: (4) $\frac{1}{4}$ " SS connectors and (2) hydrocarbon/moisture traps	kit	22462	
Includes: (4) $\frac{1}{4}$ " brass connectors and (2) hydrocarbon/moisture traps	kit	22463	



To prevent settling of dessicant, mount vertically, not horizontally.



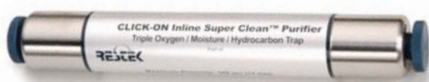
### Click-On Inline Super-Clean Indicator

- Oxygen: green to grey
- Moisture: beige to clear

Description	qty.	cat.#	price
Click-On Inline Super-Clean Indicator (oxygen, moisture)	ea.	22474	

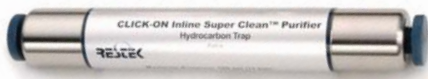


Install an indicator after the Click-On inline gas filter so there is no confusion about when to replace the traps.



### 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 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	

### Click-On Inline Super-Clean Connectors

Click-On connectors allow you to change traps quickly, without introducing oxygen into your system.

Each connector is 2<sup>3</sup>/<sub>8</sub>" (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, Stainless Steel	ea.	22479	\$215



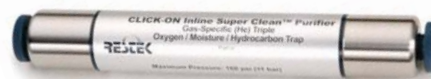
### Accessories

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
<b>Helium-Specific Carrier Gas Cleaning Kits</b>			
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	
<b>Replacement Trap</b>			
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:

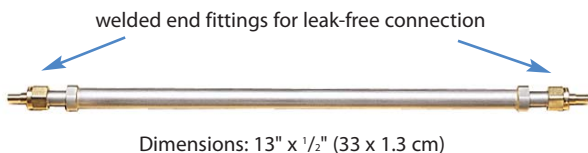
Length	21" (53.3 cm)
Diameter	1.5" (3.8 cm)
Maximum Inlet Pressure	1,000 psi (6895 kPa)
Maximum Recommended Flow	500 mL/min.
Pressure Drop from 120 psi (827 kPa) inlet at 0-500mL/min.:	<0.20 psi (1.4 kPa)
End Fittings	compression, 1/8" or 1/4", stainless steel
Shipping Weight	3.04 lb. (1,300 g)

#### Gas-Specific Purifier Module

#### Compression Tube Fittings

	qty.	1/4-inch		qty.	1/8-inch	
		cat.#	price		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. If the oxygen level in the stream exceeds 500 ppm, use an air purifier.



Dimensions: 13" x 1/2" (33 x 1.3 cm)

### 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	

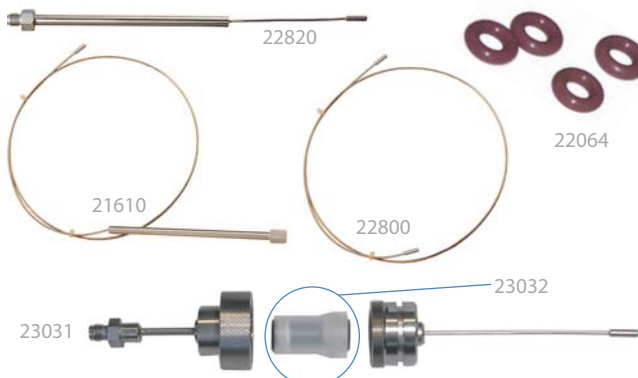
Replacement getter tubes must be used with a Thermal Gas Purifier housing unit.

### 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 is the built-in sensing circuit, which shuts the generator down if a hydrogen leak is detected.

#### Specifications

Purity:	99.9995% pure hydrogen
Delivery Pressure:	10-100 psig $\pm$ 1 psig (69-689 kPa $\pm$ 7 kPa)
Outlet Port:	$1/8$ " compression
Electrical Requirements:	100-230 VAC/50-60 Hz
Physical Dimensions:	17.12" h x 13.46" w x 17.95" d (43.48 x 34.19 x 45.6 cm)
Shipping Weight:	40 lbs. (18 kg) dry



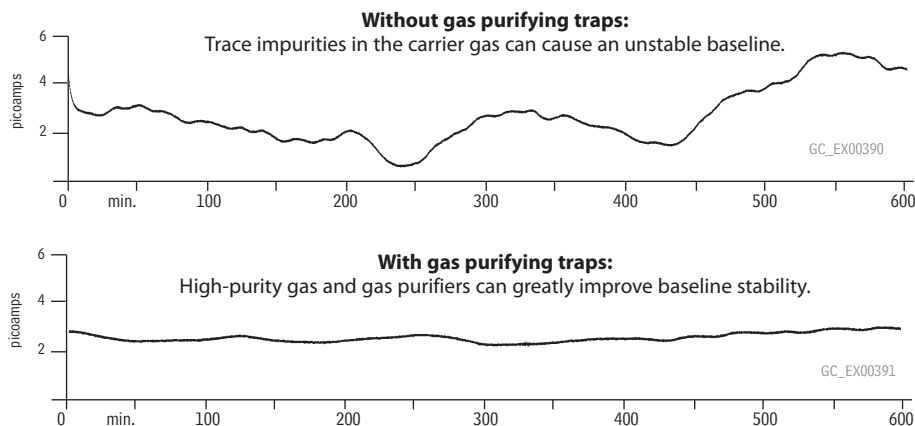
free  
literature

#### Parker Balston® Hydrogen Generators

Download your free  
copy from  
[www.restek.com](http://www.restek.com)  
lit. cat.# 580053A

Description	Model #	Capacity	qty.	cat.#	price
Hydrogen Generator	H2PEM-100	100cc/min.	ea.	23065	
Hydrogen Generator	H2PEM-165	165cc/min.	ea.	23066	
Hydrogen Generator	H2PEM-260	260cc/min.	ea.	23067	
Hydrogen Generator	H2PEM-510	510cc/min.	ea.	23068	
<b>Replacement and Maintenance Components for Hydrogen Generators (for all models listed above)</b>					
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	

**The combination of high-purity gas and gas purifying traps can save analytical time in the long run.**



Using purifying gas  
traps in combination  
with a gas generator  
can improve chro-  
matography tremen-  
dously and improve  
column lifetime.

**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: 1000 cc/min.	Weight:	53 lbs. (24kg)
	FID-2500: 2500 cc/min.		

\*Zero air inlet requires minimum of 40 psig (276 kPa) compressed air pressure.

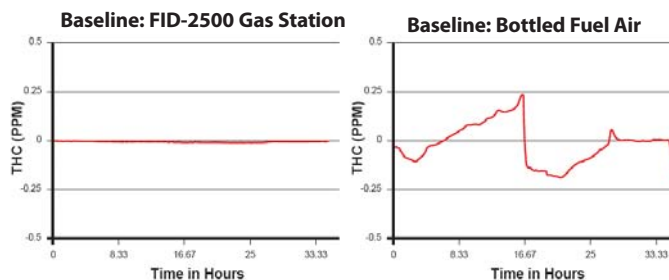


**free**  
literature

**FID Gas Stations**

Download your free copy from  
**www.restek.com**  
lit. cat.# 580051

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.



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	
<b>Replacement Components for FID Gas Stations</b>				
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 Outlet Pressure
Models HPN2-1100 and UHPN2-1100		
125 psig (862kPa)	1100	85 psig (586kPa)
110 psig (758kPa)	1000	75 psig (517kPa)
100 psig (689kPa)	900	65 psig (448kPa)
90 psig (621kPa)	800	60 psig (414kPa)
80 psig (552kPa)	700	50 psig (345kPa)
70 psig (483kPa)	600	45 psig (310kPa)
60 psig (414kPa)	500	35 psig (241kPa)
Model HPN2-2000		
75-120 psig (517-827kPa)	2000	90 psig (621kPa)



free  
literature

#### Nitrogen Generators

Download your free copy from  
[www.restek.com](http://www.restek.com)

lit. cat.# 580052

### ordering note

For **international orders**, please add the appropriate power cord suffix from the table below.

Nitrogen Generators	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 #	qty.	cat.#	price
Nitrogen Generator for LC/MS	NitroFlow Lab Model, 32 lpm max. flow	ea.	22129	
Nitrogen Generator for LC/MS	N2-04 Model for ELSD, 8 lpm max. flow	ea.	22130	
Nitrogen Generator for LC/MS	N2-14 (general purpose) 78 scfh max. flow at 95% purity	ea.	20677	
Nitrogen Generator for LC/MS	N2-14 with European Power Cord	ea.	20677-551	
Nitrogen Generator for LC/MS	N2-14A (general purpose w/oxygen analyzer) 78 scfh max. flow at 95% purity	ea.	21652	
Nitrogen Generator for LC/MS	N2-22 Model, 44 lpm max. flow	ea.	22131	
Nitrogen Generator for LC/MS	N2-22A Model, 29 lpm max. flow	ea.	22132	
Nitrogen Generator for LC/MS	N2-35 Model, 44 lpm max. flow	ea.	22133	
Nitrogen Generator for LC/MS	N2-35A Model, 44 lpm max. flow	ea.	22134	
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](http://www.restek.com/leakdetector) for details.

## ...and Introducing the **NEW** Restek ProFLOW 6000 Electronic Flowmeter



Go to [www.restek.com/flowmeter](http://www.restek.com/flowmeter) for details.

**RESTEK**
**CHROMALYTIC** +61(0)3 9762 2034  
ECHnology Pty Ltd

 Australian Distributors  
Importers & Manufacturers  
[www.chromtech.net.au](http://www.chromtech.net.au)
**11/12**
[www.restek.com](http://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

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

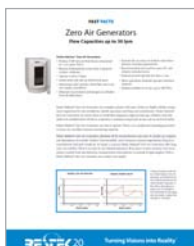
#### Specifications

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)	
Inlet/Outlet Ports:	1/4" NPT (female)	
Start-up Time to Specified Hydrocarbon Concentration:	45 minutes	
Electrical Requirements:	75-83NA	120 VAC/60 Hz, 0.5 amps
	Other Models	120 VAC/60 Hz, 3.5 amps
Dimensions:	75-83NA	12"h x 10"w x 3"d (30 cm x 25 cm x 8 cm)
	Other Models	16"h x 11"w x 13"d (42 cm x 27 cm x 3 cm)
Shipping Weight:	75-83NA	7 lbs. (3 kg)
	Other Models	41 lbs. (19 kg)

### ordering note

For **international orders**, please add the appropriate power cord suffix from the table below.

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	
<b>Maintenance Kits (includes a one-year supply of prefilters and final filter)</b>				<b>qty.</b>	<b>cat. #</b>
Maintenance Kit	for 75-83NA		kit	21646	<b>price</b>
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	



### free literature

#### Zero Air Generators

Download your free copy from

[www.restek.com](http://www.restek.com)

lit. cat.# 580050

### 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	

**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	qty.	cat.#	price
<b>Single-Stage Regulator</b>			
CGA 330 (H <sub>2</sub> S and other reduced sulfurs)	ea.	21361-5	
CGA 350 (H <sub>2</sub> , P <sub>2</sub> )	ea.	21361-6	
CGA 660 (NO, NO <sub>2</sub> , SO <sub>2</sub> )	ea.	21361-11	
<b>Dual-Stage Regulator</b>			
CGA 330 (H <sub>2</sub> S and other reduced sulfurs)	ea.	21360-2	
CGA 350 (H <sub>2</sub> , P <sub>2</sub> )	ea.	21360-7	
CGA 660 (NO, NO <sub>2</sub> , SO <sub>2</sub> )	ea.	21360-12	

For other CGA fittings, please contact your local Restek representative.



**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  $1 \times 10^{-8}$  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 <sub>2</sub> , He, Ar)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	21667	
CGA 350 (H <sub>2</sub> , P <sub>2</sub> )	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	



### Single-Stage Ultra-High Purity Chrome-Plated Brass Gas Regulators

- Oxidation-resistant, chrome-plated.
- 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	Outlet Gauge	qty.	cat.#	price
CGA 580 (N <sub>2</sub> , He, Ar)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	20646	
CGA 350 (H <sub>2</sub> , P <sub>2</sub> )	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 <sub>2</sub> , He, Ar)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20662	
CGA 350 (H <sub>2</sub> , P <sub>2</sub> )	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	Outlet Gauge	qty.	cat.#	price
CGA 580 (N <sub>2</sub> , He, Ar)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20665	
CGA 350 (H <sub>2</sub> , P <sub>2</sub> )	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20666	
CGA 590 (Air)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20667	



### Flexible Stainless Steel Hoses

Description	Length	Fittings	qty.	cat.#	price
Flexible Stainless Steel Hose	36"	1/4" Female NPT	ea.	21339	
Flexible Stainless Steel Hose	18"	1/4" Female NPT	ea.	21340	
Flexible Stainless Steel Hose	36"	Stainless Steel CGA 580	ea.	21344	



### 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 <sub>2</sub> , He, Ar)	ea.	21336	
CGA 350 Fitting, (H <sub>2</sub> , P <sub>2</sub> )	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	

**RESTEK**

**CHROMALYTIC** +61(0)3 9762 2034  
 ECHnology Pty Ltd

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

11/12

www.restek.com **311**



### 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 pigtails 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 pigtails (36")  
 Line regulator: 0 to 100psig (0-689kPa)

#### Brass Automatic Switchover System with Line Regulator

	qty.	cat.#	price
CGA 580 (N <sub>2</sub> , He, Ar)	ea.	20668580	
CGA 350 (H <sub>2</sub> , P <sub>2</sub> )	ea.	20668350	
CGA 590 (Air)	ea.	20668590	

#### Stainless Steel Automatic Switchover System with Line Regulator

	qty.	cat.#	price
CGA 580 (N <sub>2</sub> , He, Ar)	ea.	21593580	

### 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 <sub>2</sub> , He, Ar)	ea.	21347	
CGA 350 (H <sub>2</sub> , P <sub>2</sub> )	ea.	21348	
CGA 590 (Air)	ea.	21349	

#### Stainless Steel Protocol Station\*

	qty.	cat.#	price
CGA 580 (N <sub>2</sub> , 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.

Description	qty.	cat.#	price
Backpressure Gas Regulator	ea.	20635	

### MINICYL Regulator

This compact general purpose regulator has many laboratory applications including air-drying glassware, sparging or evaporating solutions, and controlling pneumatic valves. 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	1/4" brass nut (20)
B-402-1	1/4" brass nut (20)
B-203-1	1/4" brass front ferrule (20)
B-403-1	1/4" brass front ferrule (20)
B-204-1	1/4" brass back ferrule (20)
B-404-1	1/4" brass back ferrule (20)
B-200-C	1/4" brass cap (6)
B-400-C	1/4" brass cap (6)
B-200-P	1/4" brass plug (6)
B-400-P	1/4" brass plug (6)
B-200-6	1/4" brass union (2)
B-400-6	1/4" brass union (2)
B-400-6-2	1/4" to 1/8" brass reducing union (2)
B-200-3	1/4" brass tee (2)
B-400-3	1/4" brass tee (2)
B-400-R-2	1/4" to 1/4" brass tube end reducer (2)
B-200-R-4	1/4" to 1/8" brass tube end reducer (2)
MS-IG-200	1/4" inspection gauge (1)
MS-IG-400	1/4" inspection gauge (1)

**Swagelok #, Description, qty included in kit**

SS-202-1	1/4" SS nut (20)
SS-402-1	1/4" SS nut (20)
SS-203-1	1/4" SS front ferrule (20)
SS-403-1	1/4" SS front ferrule (20)
SS-204-1	1/4" SS back ferrule (20)
SS-404-1	1/4" SS back ferrule (20)
SS-200-C	1/4" SS cap (6)
SS-400-C	1/4" SS cap (6)
SS-200-P	1/4" SS plug (6)
SS-400-P	1/4" SS plug (6)
SS-200-6	1/4" SS union (2)
SS-400-6	1/4" SS union (2)
SS-400-6-2	1/4" to 1/8" SS reducing union (2)
SS-200-3	1/4" SS tee (2)
SS-400-3	1/4" SS tee (2)
SS-400-R-2	1/4" to 1/4" SS tube end reducer (2)
SS-200-R-4	1/4" to 1/8" SS tube end reducer (2)
MS-IG-200	1/4" inspection gauge (1)
MS-IG-400	1/4" inspection gauge (1)

Description	qty.	cat.#	price
Swagelok Fitting Kit, Brass	kit	23141	

Description	qty.	cat.#	price
Swagelok Fitting Kit, Stainless Steel	kit	23197	

**Restek's Learning Network**

Sign up for our widely acclaimed seminars today!

Visit [www.restek.com/seminars](http://www.restek.com/seminars)

## Swagelok® Fittings (Brass &amp; 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 &amp; ferrule set



plug



union



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	
Reducing Union	1/8" to 1/16"	200-6-1	5-pk.	23118		ea.	23168	
	1/4" to 1/16"	400-6-1	5-pk.	23119		2-pk.	23169	
	1/4" to 1/8"	400-6-2	5-pk.	23120		2-pk.	23170	
Tee	1/16"	100-3	2-pk.	23121		ea.	23171	
	1/8"	200-3	2-pk.	23122		ea.	23172	
	1/4"	400-3	2-pk.	23123		ea.	23173	
Cross	1/8"	200-4	2-pk.	23124		ea.	23174	
	1/4"	400-4	2-pk.	23125		ea.	23175	
Tube End Reducer	1/8" to 1/16"	100-R-2	5-pk.	23126		2-pk.	23176	
	1/4" to 1/16"	100-R-4	5-pk.	23127		2-pk.	23177	
	1/8" to 1/4"	400-R-2	5-pk.	23128		2-pk.	23178	
	1/4" to 1/8"	200-R-4	5-pk.	23129		2-pk.	23179	
Port Connector	1/8"	201-PC	5-pk.	23130		2-pk.	23180	
	1/4"	401-PC	10-pk.	23131		2-pk.	23181	
	1/8" to 1/4"	401-PC-2	5-pk.	23132		2-pk.	23182	
Male Connector	1/8" to 1/8" NPT	200-1-2	10-pk.	23133		2-pk.	23183	
	1/4" to 1/4" NPT	400-1-4	10-pk.	23134		2-pk.	23184	
	1/16" to 1/8" NPT	100-1-2	5-pk.	23135		2-pk.	23185	
	1/8" to 1/4" NPT	200-1-4	10-pk.	23136		2-pk.	23186	
	1/4" to 1/8" NPT	400-1-2	10-pk.	23137		2-pk.	23187	
Female Connector	1/8" to 1/8" NPT	200-7-2	5-pk.	23138		2-pk.	23188	
	1/4" to 1/4" NPT	400-7-4	5-pk.	23139		2-pk.	23189	
	1/4" to 1/8" NPT	400-7-2	5-pk.	23140		2-pk.	23190	
Male & Female Quick Couplings	1/8" male*	QC4D-200	—	—		ea.	23191	
	1/8" male	QC4S-200	—	—		ea.	23192	
	1/8" female*	QC4B-200	—	—		ea.	23193	
	1/4" male*	QC4D-400	—	—		ea.	23194	
	1/4" male	QC4S-400	—	—		ea.	23195	
	1/4" female*	QC4B-400	—	—		ea.	23196	

\*Includes self-sealing shut-off valve.

## also available

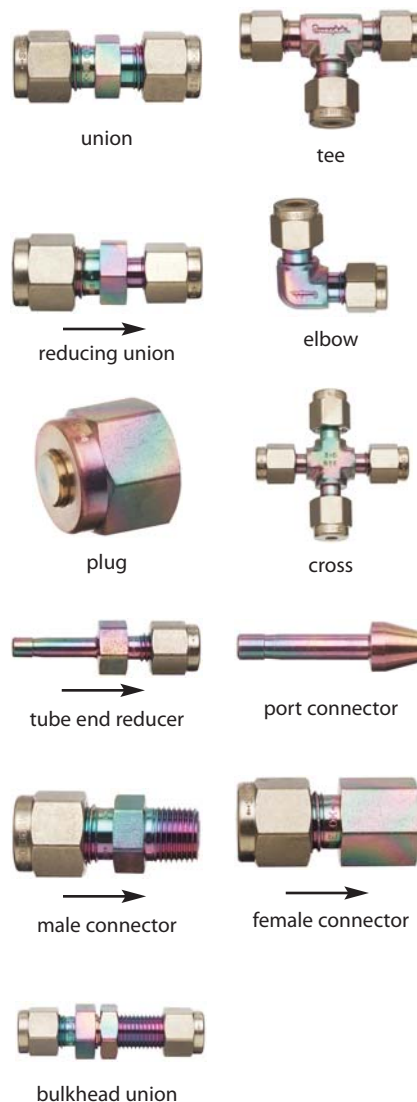
Restek also carries specialized tools for Swagelok® fittings. See page 325.



**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	
	$1/4$ "	SS-400-4	ea.	22552		ea.	22587	
Tube End Reducer	$1/8$ " tube to $1/16$ "	SS-100-R-2	ea.	22553		ea.	22588	
	$1/4$ " tube to $1/16$ "	SS-100-R-4	ea.	22554		ea.	22589	
	$1/8$ " tube to $1/4$ "	SS-400-R-2	ea.	22555		ea.	22590	
	$1/4$ " tube to $1/8$ "	SS-200-R-4	ea.	22556		ea.	22591	
Port Connector	$1/8$ "	SS-201-PC	ea.	22557		ea.	22592	
	$1/4$ "	SS-401-PC	ea.	22558		ea.	22593	
	$1/8$ " tube to $1/4$ "	SS-401-PC-2	ea.	22559		ea.	22594	
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	

**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 &amp; 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.

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"	4 SC 4	5-pk.	21820		2-pk.	21920	
Reducing Union	1/8" to 1/16"	2 RU 1	5-pk.	21823		ea.	21923	
	1/4" to 1/16"	4 RU 1	5-pk.	21824		2-pk.	21924	
	1/4" to 1/8"	4 RU 2	5-pk.	21825		2-pk.	21925	
Tee	1/16"	1 ET 1	2-pk.	21826		ea.	21926	
	1/8"	2 ET 2	2-pk.	21827		ea.	21927	
	1/4"	4 ET 4	2-pk.	21828		ea.	21928	
Cross	1/8"	2 ECR 2	2-pk.	21829		ea.	21929	
	1/4"	4 ECR 4	2-pk.	21830		ea.	21930	
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"	2 TUR 4	ea.	21546		ea.	22882	
	1/4" tube to 1/8"	4 TUR 2	ea.	21547		ea.	22883	
Port Connector	1/8"	2 PC 2	ea.	21548		ea.	22884	
	1/4"	4 PC 4	ea.	21549		ea.	22885	
	1/8" tube to 1/4"	2 PC 4	ea.	21550		ea.	22886	
Male Connector	1/8" to 1/8" NPT	2 MSC 2N	ea.	21551		ea.	22887	
	1/4" to 1/4" NPT	4 MSC 4N	ea.	21552		—	—	
	1/16" to 1/8" NPT	1 MSC 2N	ea.	21553		ea.	22889	
	1/8" to 1/4" NPT	2 MSC 4N	ea.	21554		ea.	22890	
	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		—	—	

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**.



union



tee



reducing union



elbow



plug



cross



tube end reducer



port connector



male connector



female connector



plug valve, 2-way



ball valve, 2-way

**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 permeates the surface. It compresses with minimal damage.

#### 3. Is welding possible after treatment?

Yes. The coating does not interfere with the welding of two coated components. The coating is lost at the weld and in the heat affected zones approximately 2 to 5 mm on either side of the weld.

#### 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 highly inert, unlike impure glass.

#### 9. How can I clean the surface of a treated part after use?

Most often, a mild organic solvent (methylene chloride, methanol, hexane) or water is sufficient. Mild sonication may assist and accelerate the process. Do not use caustic, abrasive, or high pH (pH>8) cleaners, as they will damage or dissolve the layer. Steam cleaning in the presence of oxygen or air could create surface activity, and also should 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:

# of Pieces	Added Charge
5 to 15	0
16 to 30	
31 to 75	
76 to 99	
100 to 200	

## Precleaned Copper Tubing

- Adheres to ASTM B-280.
- Precleaned and ready to use.
- Use for plumbing GC systems.

ID	OD	Wall	qty.	cat.#	price
0.065"	1/8"	0.030"	50 ft.	21590	
0.190"	1/4"	0.030"	50 ft.	21592	



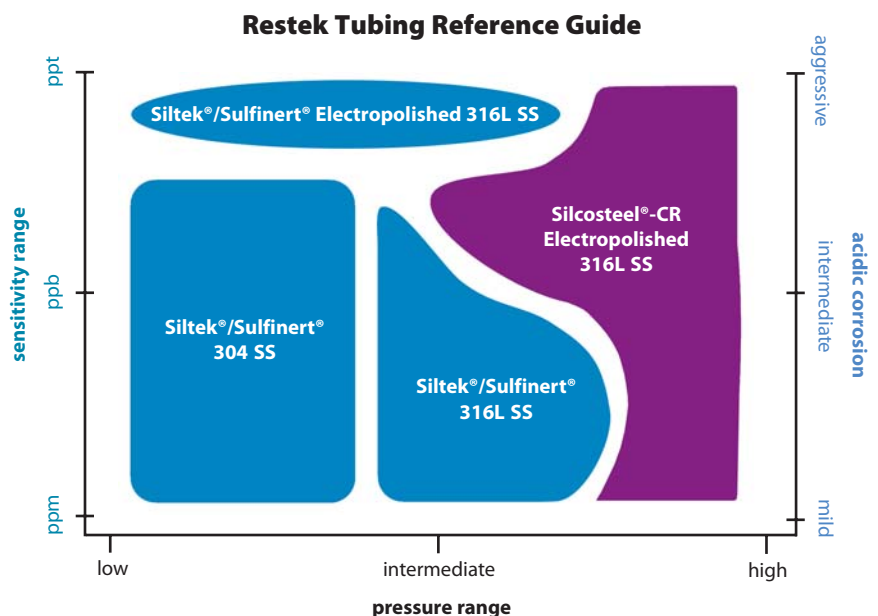
## Plumbing a GC

It is essential to use clean chromatographic-grade tubing to plumb a GC. Standard-grade tubing contains residual hydrocarbon contaminants from the drawing process. These contaminants 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.

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	\$50
16 to 30	\$100
31 to 75	\$150
76 to 99	\$200
100 to 200	\$250

## 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)

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 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.
- lower pressures.
- inert applications.

## Siltek®/Sulfinert® Treated (Coiled)

OD	ID	Wall Thickness	cat.#	Price-per-foot			
				5-24 ft.	25-199 ft.	200-399 ft.	> 400 ft.
0.022" (0.56mm)	0.011" (0.28mm)		22500				
0.029" (0.74mm)	0.021" (0.53mm)		22501				
1/16" (1.59mm)	0.010" (0.25mm)		22502				
1/16" (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				

## 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				

## 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-per-foot			
				5-24 ft.	25-199 ft.	200-399 ft.	> 400 ft.
$1/16$ " (1.59mm)	0.010" (0.25mm)		22497				
$1/16$ " (1.59mm)	0.020" (0.51mm)		22496				
$1/16$ " (1.59mm)	0.030" (0.76mm)		22495				
$1/16$ " (1.59mm)	0.040" (1.02mm)		22494				
$1/8$ " (3.18mm)	0.085" (2.16mm)	0.020"	22493				
$1/4$ " (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®**



	$\frac{1}{8}$ " Brass		$\frac{1}{4}$ " Brass		$\frac{1}{8}$ " Stainless Steel		$\frac{1}{4}$ " 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	

**Metering Gas Valves**  
**Swagelok®**



23206

Description	qty.	cat.#	price
$\frac{1}{8}$ " Brass			
Metering Valve, straight	ea.	23148	
$\frac{1}{4}$ " Brass			
Metering Valve, straight	ea.	23149	
$\frac{1}{8}$ " Stainless Steel			
Metering Valve, straight	ea.	23204	\$240
$\frac{1}{4}$ " Stainless Steel			
Metering Valve, straight	ea.	23205	
Vernier Knob for Metering Valve	ea.	23206	\$40



23148

**Shut-Off Gas Valves**  
**Parker Balston®**



	$\frac{1}{8}$ " Brass		$\frac{1}{4}$ " Brass		$\frac{1}{8}$ " Stainless Steel		$\frac{1}{4}$ " 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**.

**Metering Gas Valves**  
**Parker Balston®**

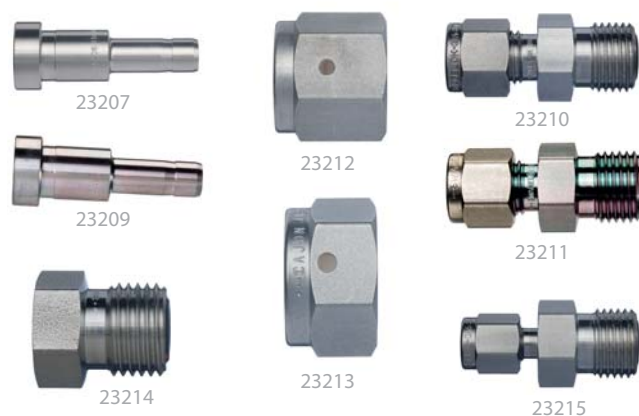


22209

Description	qty.	cat.#	price
$\frac{1}{8}$ " Nickel-Plated Brass			
Metering, straight	ea.	22200	
$\frac{1}{4}$ " Nickel-Plated Brass			
Metering, straight	ea.	22201	
$\frac{1}{8}$ " Stainless Steel			
Metering, straight	ea.	22204	
$\frac{1}{4}$ " Stainless Steel			
Metering, straight	ea.	22205	
Vernier Knob for Metering Valve	ea.	22209	



22200



**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.



Swagelok® VCO® O-ring face seal fittings are designed for rapid assembly in pipe, tube, and welded systems.



**Specifications:**

Pressure Ratings	Up to 15,400 psig (1061 bar)
Temperature Ratings	Up to 400 °F (204 °C)

Description	Material	qty.	cat.#	price
$\frac{1}{4}$ " VCO to $\frac{1}{4}$ " Tube Adaptor	Stainless Steel	2-pk.	23207	
$\frac{1}{4}$ " VCO to $\frac{1}{4}$ " Tube Adaptor	Siltek Treated	2-pk.	23209	
$\frac{1}{4}$ " VCO to $\frac{1}{4}$ " Tube Fitting	Stainless Steel	2-pk.	23210	
$\frac{1}{2}$ " VCO to $\frac{1}{4}$ " Tube Fitting	Siltek Treated	ea.	23211	
$\frac{1}{4}$ " VCO to $\frac{1}{8}$ " Tube Fitting	Stainless Steel	2-pk.	23215	
$\frac{1}{4}$ " VCO to $\frac{1}{8}$ " Tube Fitting	Siltek Treated	ea.	23216	
$\frac{1}{2}$ " VCO Nut	Stainless Steel	2-pk.	23212	
$\frac{1}{4}$ " VCO Nut Blind	Stainless Steel	2-pk.	23213	
$\frac{1}{4}$ " VCO Body Blind	Stainless Steel	2-pk.	23214	
Replacement O-Ring, 70 Durometer Fluorocarbon FKM, VCO $\frac{1}{4}$ ", Size 010		10-pk.	23208	

Gap inspection gauge available on **page 325**.



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	



23004

### 54-Piece Tool Kit

Set comes with screwdrivers, pliers, wrenches, sockets, scissors, clamps, and more. Durable, zippered, notebook-style carrying case for easy transport.

Description	qty.	cat.#	price
Tool Kit	kit	23004	

### 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	



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	

### 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	



23002

### 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	





20192

### 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	



### 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.	23011	
Replacement Cutting Wheels	2-pk.	23012	

\*Not for use with stainless steel tubing.



22621

### 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	



23029



Dimensions: 8" x 6 1/2" x 4 1/4"  
 (20.3 x 15.9 x 10.8 cm)  
 Weight: 11 lbs. (5.0 kg)

### 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).

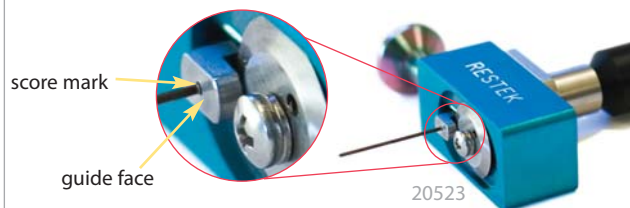
### Restek Tubing Scorer

for MXT® Columns

- 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.

Enlarged view—score mark flush with guide face.



20523

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	



20134

### Tubing Reamer

- Removes burrs from stainless steel tubing.
- For 1/4- or 1/8-inch tubing.
- Nonslip safety design.

Description	qty.	cat.#	price
Tubing Reamer	ea.	20134	



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.



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	



22622

### Swaging Tool

- Preswage compression fittings for easy installation.
- Ideal for installations in tight areas.
- For Swagelok® fittings only.

Description	qty.	cat.#	price
Swaging Tool	ea.	22622	



22623

### Tee Wrench

- Hold 1/4" or 6 mm tee or cross fittings secure in multiple orientations during installation.
- Fits easily in tool box, pouch, or belt.
- Cushioned vinyl grip with generous gripping area.
- For Swagelok® fittings only.

Description	qty.	cat.#	price
Tee Wrench	ea.	22623	



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	

# HPLC ACCESSORIES

Instrument Accessories & Parts .....	327-332
Tubing & Connections .....	332-335
Tools & Maintenance .....	336-337
Mobile Phase Accessories	
Bottle Tops .....	338-339
Dampers .....	340
Degassers .....	340-341
Filters .....	341-342
Heaters .....	343
Mixers & Splitters .....	344
Valves .....	345
Backpressure Regulators .....	345
Syringes .....	346-349
LC/MS Nitrogen Purification/Generation .....	350
Lab Organizers .....	350
Column Hardware .....	351



**RESTEK**

**HRMalytic** +61(0)3 9762 2034  
**ECH**nology Pty Ltd

Australian Distributors  
Importers & Manufacturers  
[www.chromtech.net.au](http://www.chromtech.net.au)

**11/12**

## Restek Replacement Parts for Agilent HPLC Systems

Meet or exceed OEM performance.

Description	Model #	Similar to Agilent part #	qty.	cat.#	price
<b>Preventive Maintenance Kit</b> Includes: rotor seal, needle seat, needle assembly, seat cap	1050	01078-68721	kit	25259	
<b>Autosampler Preventive Maintenance Kit</b> Includes: rotor seal, needle assembly, needle seat	1100	G1313-68709	kit	25271	
<b>Pump Maintenance Kit</b> Includes: PTFE frit, outlet cap, active inlet cartridge, gold disk seal, 2 piston seals, glass solvent filter	1050, 1100	G1311-68710	kit	25270	
Active Inlet Cartridge	1050, 1100, 1200	5062-8562	ea.	26393	
Outlet Ball Valve, Binary Pump	1100, 1200	G1312-60012	ea.	25267	
Outlet Ball Valve	1050, 1100, 1200	G1311-60012	ea.	25276	
Sieves for Outlet Valve	1050, 1100, 1200	5063-6505	10-pk.	25266	
Check Valve Cartridge Assembly	1090	79835-67101	ea.	25344	
Piston Seals, Teflon w/Graphite, Black*	1050, 1100, 1200	5063-6589	2-pk.	22482	
Piston Seals, Teflon w/Graphite, Black*	1050, 1100, 1200	5063-6589	10-pk.	22483	
Piston Seals (Black)	1090	5062-2494	4-pk.	25347	
Seal Wash Kit, Binary Pump (4 seals, 4 gaskets)	1100		kit	25268	
Seal Wash Kit (2 seals, 2 gaskets)	1050, 1100		kit	25269	
Wash Seal	1050, 1100, 1200	0905-1175	ea.	25277	
Sapphire Piston	1050, 1100, 1200	5063-6586	ea.	25273	
Sapphire Piston	1090	6980-0672	ea.	25345	
Needle Seat	1050	79846-67101	ea.	25258	
Needle Seat	1090	79846-67101	ea.	25348	
Needle Seat Assembly	1100	G1313-87101	ea.	25265	
Needle Assembly	1100	G1313-87201	ea.	25278	
Rotor Seal (not for use with 7125 injection valve)	1050	0101-0626	ea.	25272	
Rotor Seal	1100	0100-1853	ea.	25275	
Rotor Seal (Rheodyne-style)	1090	1535-4048	ea.	25349	
Frits, PTFE	1050, 1100, 1200	01018-22707	5-pk.	25466	
Seal, Gold Disk (outlet)	1050, 1100, 1200	5001-3707	ea.	25467	
Outlet Cap	1050, 1100	5062-2485	4-pk.	25139	
Outlet Cap & Gold Seal Assembly	1050, 1100		2-pk.	25140	
Connecting Tube	1050, 1100	G1311-67304	ea.	25058	
Bottle Head Assembly		G1311-60003	ea.	25059	
Detector Lamp, 1090 DA, 1050 VW/DA/MWD	1090, 1050	79883-60002	ea.	25260	
Lamp, DAD G1315A, G1365A	1100, 1200	2140-0590	ea.	25261	
Lamp, VWD G1314A	1100, 1200	G1314-60100	ea.	25262	
8453 Deuterium Lamp		2140-0605	ea.	25263	
G1321 Fluorescence Detector Flash Lamp		2140-0600	ea.	25264	
Lamp, DAD Long Life Deuterium (2000 hours)	1100	2140-0813	ea.	25399	
Helium Tubing, PTFE, 5m x 0.057" ID	1050, 1100	5062-2461	ea.	24990	
Injector Lubricant, PTFE, 10g	1050, 1100	79841-65501	ea.	26520	
	1040, 1050, 1090,				
Solvent Inlet Filter, SS	1100, 1200	01018-60025	ea.	26423	
Stator Face Assembly	1100, 1200	0100-1851	ea.	26424	

\*Graphite-filled Teflon; best for organic solvents.



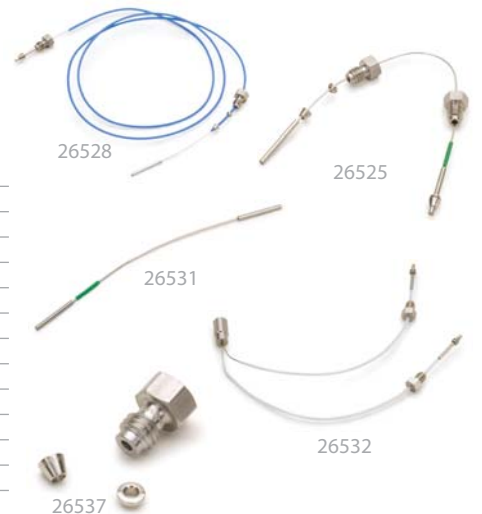
NEW!



also available

**Outlet Cap & Gold Seal Assembly Tool**  
 See page 337.


NEW!



## Capillary Stainless Steel Tubing Assemblies for Agilent HPLC Systems

- Precut, micropolished tubing and presealed fittings for quick, easy maintenance of your Agilent HPLC systems.
- Meet or exceed manufacturer's performance.

Description	Model #	Similar to Agilent part #	qty.	cat.#	price
Capillary SS Tubing with fittings, 130mm x 0.17mm ID	1090	01090-87305	ea.	26525	
Capillary SS Tubing with fittings, 800mm x 0.17mm ID	1050	01078-87305	ea.	26526	
Capillary SS Tubing with fittings, 180mm x 0.17mm ID	1100	G1313-87305	ea.	26527	
Capillary SS Tubing with fittings, 700mm x 0.25mm ID	1050	01018-67305	ea.	26528	
Capillary SS Tubing with fittings, 700mm x 0.25mm ID	1050	01078-87306	ea.	26529	
Seat Capillary, SS Tubing, 0.17mm ID	1050	01078-87303	ea.	26530	
Capillary SS Tubing, 105mm x 0.17mm ID	—	5021-1816	ea.	26531	
Mixing Capillary Assembly	1100	G1312-67302	ea.	26532	
Capillary SS Tubing, Valve to Metering Head	1100	G1313-87301	ea.	26533	
Capillary SS Tubing, 150mm x 0.17mm ID	—	5021-1817	ea.	26534	
Capillary SS Tubing, 280mm x 0.17mm ID	—	5021-1818	ea.	26535	
Capillary SS Tubing, 400mm x 0.17mm ID	—	5021-1819	ea.	26536	
1/8" Fitting, Front and Back Ferrules, Stainless Steel	—	5062-2418	10-pk.	26537	

RESTEK

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

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

11/12

www.restek.com

327





25440



25450

## Restek Replacement Parts for Beckman HPLC Systems

Description	Model #	Similar to Beckman part #	qty.	cat.#	price
Inlet Check Valve Assembly	110A&B, 112, 114M, 116, 118, 125, 126, 127, 128 Pumps	240720	ea.	25439	
Outlet Check Valve Assembly	110A&B, 112, 114M, 116, 118, 125, 126, 127, 128 Pumps	240721	ea.	25440	
Inlet Check Valve Cartridge for Check Valve Assembly	110A&B, 112, 114M, 116, 118, 125, 126, 127, 128 Pumps	240620	ea.	25441	
Outlet Check Valve Cartridge for Check Valve Assembly	110A&B, 112, 114M, 116, 118, 125, 126, 127, 128 Pumps	240621	ea.	25442	
Guide Sleeve for Graphite Plunger Guide	110 Series Pumps	243713	ea.	25444	
Outlet Check Filter Frit Assembly	110 Series Pumps	240619	ea.	25445	
Piston Guide Assembly	110 Series and 112 Pumps	243045	ea.	25446	
Plunger	110 Series and 112 Pumps	243053	ea.	25447	
Plunger Seal	110 Series Pumps	887138	ea.	25448	
Sapphire Plunger	114M, 116, 118, 125, 126, 127, 128 Pumps	240714	ea.	25450	
Plunger Seal	114M, 116, 118, 126, 127, 128 Pumps	241037, 237162	ea.	25451	
Pump Seal, Gold**	114, 116, 125, 126, 127, 128 Pumps	241037	ea.	25452	
Plunger Wash Seal	125, 126, 127, 128 Pumps	728772, 728772	ea.	25453	
Deuterium Lamp	DU60, 62, 64, 65	596791	ea.	25454	

\*\*Ultra-high molecular weight polyethylene (UHMWPE); increased resistance to abrasion, best for buffers.

## Restek Replacement Parts for Hitachi HPLC Systems



Description	Model #	Similar to Hitachi part #	qty.	cat.#	price
SS Check Valve Cartridges (1/16" Ruby Ball)	655/6000/6200	AN0-085	2-pk.	25455	
Inlet Check Valve Assembly	655/6000/6200	AN0-0833, 885-1330	ea.	25456	
Outlet Check Valve Assembly	655/6000/6200	AN0-0834, 885-1331	ea.	25457	
Plunger Assembly	655, 6000, 6200, 7100	810-1033	ea.	25458	
Plunger Seal, Black*	L655A, 6000, 6200, 7100	655-1080	ea.	25459	
Plunger Seal, Gold**	655, 6000, 6200, 7100	655-1080	ea.	25460	
Inlet Check Valve Assembly	L-7100	AN0-0836	ea.	25461	
Outlet Check Valve Assembly	L-7100	AN0-0837	ea.	25462	
Rotor Assembly for Dilutor Valve	AS-7200 Autosampler AS-7200,	810-3095	ea.	25463	
Rotor Seal Kit	AS-7250 Injection Valve	AN0-0818	ea.	25464	
Deuterium Lamp, Prealigned	L4000, L4200, L4250, L7400	AN0-0424	ea.	25465	

\*Graphite-filled Teflon; best for organic solvents.

\*\*Ultra-high molecular weight polyethylene (UHMWPE); increased resistance to abrasion, best for buffers.

## Restek Replacement Parts for PerkinElmer HPLC Systems



Description	Model #	Similar to PE part #	qty.	cat.#	price
Inlet Check Valve	PE 200, 4, 250, 400, 410, 620	2540177	ea.	25438	
Outlet Check Valve	PE 200, 4, 250, 400, 410, 620	2540197	ea.	25437	
Standard Pump Seal Kit	PE 200	N2910383	kit	26425	
High Pressure Seal Kit	PE Series 200 Pumps-1, 2, 3, 3B, 4, 10, 250, 400, 410, 620, Int. 4000 Pump	2540275	ea.	25433	
Standard High Pressure Seal, Gold**	PE Series 200 Pumps-1, 2, 3, 3B, 4, 10, 250, 400, 410, 620, Int. 4000 Pump	9907324	ea.	25434	
Low Pressure Seal, Gold**	PE Series 200 Pumps	9907339	ea.	25435	
Needle	PE Series 200 Pumps	N2930023	ea.	25432	
Deuterium Lamp	PE Lambda-2, 5, 7, 8, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 40, 800, 900	B0160917	ea.	25436	
Deuterium Lamp	PE 200/785A	N2920149	ea.	25431	

\*\*Ultra-high molecular weight polyethylene (UHMWPE); increased resistance to abrasion, best for buffers.

**Restek Replacement Parts for Shimadzu HPLC Systems**

Description	Model #	Similar to Shimadzu part #	qty.	cat. #	price
Inlet Check Valve	LC-6A, LC-10AS	228-12353-91	ea.	25287	
Inlet Check Valve	LC-600, LC-9A, LC-10AD	228-18522-91	ea.	25295	
Inlet Check Valve	LC-10ADvp	228-39093-92	ea.	24984	
Inlet Check Valve	LC-10AT, LC-10ATvp	228-32166-91	ea.	26521	
Inlet Check Valve	LC-20AD/B	228-48249-91	ea.	26426	
Outlet Check Valve	LC-6A, LC-10AS	228-09054-93	ea.	25288	
Outlet Check Valve Rebuild Kit	LC-6A, LC-10AS	228-11200-91	2-pk.	25289	
Outlet Check Valve	LC-600, LC-9A, LC-10AD, LC-10AT	228-18522-92	ea.	25282	
Outlet Check Valve	LC-10ADvp, LC-10ATvp	228-34976-91	ea.	24983	
Outlet Check Valve	LC-20AD/B	228-45705-91	ea.	26427	
Plunger Seal, Gold**	LC-6A	228-11999-00	ea.	25285	
Plunger Seal, Polyethylene, Gold**	LC-10AS, LC-10AT, LC-10ATvp	228-21975-00	ea.	25290	
Plunger Seal	LC-600, LC-9A, LC-10AD	228-18745-00	ea.	25293	
Plunger Seal, Black*	LC-10ADvp, LC 20AD	228-35146-00	ea.	24980	
Plunger Seal, Gold**	LC-10ADvp	228-32628-00	ea.	24981	
Plunger Seal, Black*	SIL-10ADvp, LC-10ATvp	228-35145-00	ea.	24985	
Plunger Rinse Seal	LC-10AS	228-28499-00	ea.	25292	
Sapphire Plunger	LC-10AS	228-17019-93	ea.	25291	
Sapphire Plunger	LC-600, LC-9A, LC-10AD	228-18523-91	ea.	25294	
Needle Seal	SIL-10A, 10XL, 10ADvp	228-33355-04	ea.	25468	
Rotor Seal	SIL-10ADvp	228-21217-97	ea.	24986	
Rotor Seal Assembly	SIL-10A, 10AXL	228-21217-91	ea.	25469	
Stator Assembly	SIL-10A, 10AXL	228-21220-91	ea.	25470	
Syringe, 500µL	SIL-10A, 10AXL	228-25237-04	ea.	25471	
Plunger Assembly, Ceramic	LC-10ADvp	228-35601-91	ea.	25472	
Plunger Assembly, Ceramic	LC-10ATvp	228-35009-92	ea.	25473	
Plunger Assembly, Sapphire	LC-10ADvp	228-35601-92	ea.	24982	
Deuterium Lamp	SPD-10A, 10AV, SPD-20A	228-34016-02	ea.	25284	

\*Graphite-filled Teflon; best for organic solvents.

\*\*Ultra-high molecular weight polyethylene (UHMWPE); increased resistance to abrasion, best for buffers.



26521



## Catch the Buzz

Sign up for Restek's e-newsletter, *The Buzz*  
[www.restek.com/buzz](http://www.restek.com/buzz)



25474



25482



25484



25476

25280  
(both sides shown)

25407

25408

25404

## Restek Replacement Parts for Thermo Scientific HPLC Systems

Description	Model #	Similar to SP/TSP			
		part #	qty.	cat.#	price
Inlet Check Valve Assembly	SP8800 & P-Series Pumps	A3495-010	ea.	25474	
Outlet Check Valve Assembly	SP8800 Series Pumps	A3490-010	ea.	25475	
Piston	SP8800 & P-Series Pumps	A3102-010	ea.	25476	
Back-up Seal	SP8800 & P-Series Pumps	A2963-010	ea.	25477	
Plunger Seal, Gold**					
Superseal	SP8800 & P-Series Pumps	A2962-010	ea.	25478	
Check Valve and Transducer Assembly	P-Series Pumps	A3990-010	ea.	25479	
Kel-F Washer	P-Series Pumps	A2973-010	ea.	25480	
Rotor Seal Assembly, Rheodyne 7010	TSP AS100, 300, 1000, 3000, 3500, 8875, and 8880 Autosamplers	7010-039	ea.	25481	
Syringe Assembly, 250µL	TSP AS100, 300, 1000, 3000, 3500, 8875, and 8880 Autosamplers	A3588-020	ea.	25482	
Syringe, 500µL	8800 Series	3301-0100	ea.	25483	
Lamp, UV	Linear UV-200, 203, 204, 205, 206, and UV 100, 150, 1000, and 2000 Detectors	9551-0023	ea.	25484	

\*Graphite-filled Teflon; best for organic solvents.

\*\*Ultra-high molecular weight polyethylene (UHMWPE); increased resistance to abrasion, best for buffers.

## Restek Rheodyne® Style Replacement Parts for Waters HPLC Systems

Description	Model #	Similar to Rheodyne			
		part #	qty.	cat.#	price
Vespel Rotor Seal	1090, 7000, 7010, 7040, 7067	7010-039	ea.	25279	
Vespel Rotor Seal	7125, 7126, 7725, 7725i, 9725	7125-047	ea.	25280	
Isolation Seal	7010	7010-015	ea.	25281	

For easy access to Rheodyne fittings, use a ValvTool Wrench. See page 337.

## Restek Replacement Parts for Waters Detectors

Description	Model #	Similar to Waters			
		part #	qty.	cat.#	price
Window Gasket	484, 486, 490	80335	ea.	25423	
Lamp Side Gasket	484, 486, 490	80336	ea.	25424	
Quartz Lens	486	80687	ea.	25427	
Xenon Lamp (without holder or mirror)	470	—	ea.	25404	
Xenon Lamp	474	—	ea.	25405	
Deuterium Lamp (UV/Vis)	480, 481	99499	ea.	25403	
Deuterium Lamp (UV/Vis)	484	80357	ea.	25406	
Deuterium Lamp (UV/Vis)	486	80678	ea.	25407	
Deuterium Lamp	996, 2996	WAT052586	ea.	25408	
Deuterium Lamp	2487	WAS081142	ea.	25409	
Deuterium Lamp, long life (2,000 hours)*	486	80678	ea.	25410	

\*Standard lamps have nominal 1,000-hour life.

also available

LC autosampler syringes

See page 349.



## Restek Replacement Parts for Waters HPLC Systems

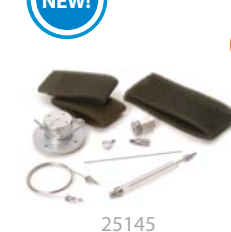
Description	Model #	Similar to Waters part #	qty.	cat.#	price
<b>Preventive Maintenance Kit</b>					
Includes: sparge diffuser, filter insert, compression screws, SS ferrule, battery for 2690/717, 250µL WISP syringe, seal wash plunger seal kits (2), wash tube seal kits (4), 2690 seal pack rebuild kit (steel bodies not included), 2690 head plunger seal kits (2), solvent reservoir 20µm filters (4), Alliance check valve cartridges (2), Alliance plunger assemblies (2), 2690 face seals (4)					
	Alliance 2690, 2695	WAT270944	kit	25143	
<b>Preventive Maintenance Kit</b> Includes: PerformancePLUS cartridges (2), sparge diffusers (4), Super Seals (2), solvent reservoir 20µm filters (2), sapphire plungers (2), reference valve rebuild kit, inlet manifold kit					
	600 Pump	WAT052675	kit	25144	
<b>Preventive Maintenance Kit</b> Includes: 717 seal pack with needle, filter insert, 250µL WISP syringe					
	717 Autosampler	WAT052669	kit	25145	
<b>Preventive Maintenance Kit</b>					
Includes: 616/326/625 plunger assemblies (2), pump seal kit, sparge diffusers (4), solvent reservoir 20µm filters (4), 616 cartridge assemblies (4)					
	616 Pump	WAT052672	kit	25146	
<b>Preventive Maintenance Kit</b> Includes: PerformancePLUS check valves (2), sparge diffuser, solvent 10µm filter, sapphire plungers (2), plunger seals (2)					
	515 Pump	WAT052587	kit	26519	
<b>Preventive Maintenance Kit</b>					
Includes: plungers, check valves, seals, filters					
	1525 Pump	201000114	kit	26430	
Inlet Check Valve Assembly	M6KA, 501, 510, 515, 590, 600E	33679, 25214	ea.	25360	
Inlet Check Valve Housing	M6KA, 501, 510, 515, 590, 600E	25203	ea.	25361	
Inlet Check Valve Rebuild Kit	M6KA, 501, 510, 515, 590, 600E	60495	2-pk.	25362	
Outlet Check Valve Assembly (Actuator Style)	M6KA, 501, 510, 515, 590, 600E	WAT025028	ea.	25363	
Outlet Check Valve Housing (Actuator Style)	M6KA, 501, 510, 515, 590, 600E	25212	ea.	25364	
Outlet Check Valve Rebuild Kit (Actuator Style)	M6KA, 501, 510, 515, 590, 600E	26016	2-pk.	25365	
Outlet Check Valve Assembly (Ball & Seat Style)	M6KA, 501, 510, 515, 590, 600E	25216	ea.	25366	
Outlet Check Valve Housing (Ball & Seat Style)	M6KA, 501, 510, 515, 590, 600E	25207	ea.	25367	
Outlet Check Valve Rebuild Kit (Ball & Seat Style)	M6KA, 501, 510, 515, 590, 600E	26014	2-pk.	25368	
Inlet Check Valve Assembly, 225µL (Extended Flow)	M6KA, 501, 510, 515, 590, 600E	60307	ea.	25369	
PerformancePLUS Check Valve Cartridge	M6KA, 501, 510, 515, 590, 600E	700000254	2-pk.	25370	
Check Valve Rebuild Kit (Extended Flow)	M6KA, 501, 510, 515, 590, 600E	88223	2-pk.	25371	
PerformancePLUS Check Valve Housing	M6KA, 501, 510, 515, 590, 600E		ea.	25372	
Check Valve Cartridges	Alliance	WAT270941	2-pk.	25373	
Super Seal for Analytical Heads	M6KA, 501, 510, 515, 590, 600E	22946, 22934	ea.	25374	
Plunger Seal, Gold for Analytical Heads**	M6KA, 501, 510, 515, 590, 600E	22934	ea.	25375	
Plunger Seal, Black for graphite-filled Teflon*	M6KA, 501, 510, 515, 590, 600E	26613	ea.	25378	
Plunger Seal, Black for EF Heads*	510, 590, 600E	26644	ea.	25379	
Plunger Seal, Gold for EF Heads**	510, 590, 600E	26644	ea.	25380	
Seal Wash Plunger Seal	Alliance	WAT271018	2-pk.	25386	
Head Plunger Seal Kit	Alliance	WAT270938	2-pk.	25387	
Head Plunger Seal Kit (Black)	Alliance	WAT271066	2-pk.	25388	
Head Plunger Seal	Acquity, nanoAcquity	700002599	2-pk.	26428	
Insert Seal Parts Kit	M6KA, 501, 510, 515, 590, 600E	60012	kit	25389	
Sapphire Plunger	M6KA, 510, 590, 600	25656	ea.	25381	
Sapphire Plunger (Extended Flow)	510, 590, 600E	60304	ea.	25382	
Sapphire Plunger Assembly Kit	M515	WAS207069	ea.	25384	
Sapphire Plunger	616, 625, 626	31788	ea.	25420	
Sapphire Plunger	Alliance	WAT270959	ea.	25385	
Draw-Off Tube Assembly	510, 515, 600, 610	WAT060476	ea.	25392	
Inlet Manifold Kit	M45, 501, 510, 590, 600E	60448	kit	25412	
Ferrule, Stainless Steel	515	22330	ea.	25417	
Face Seals Replacement Kit	Alliance 2690	WAT270939	4-pk.	26547	
Wash Face Seal	Alliance 2690	WAT271017	ea.	25428	
Wash Tube Seal Kit	Alliance 2690	WAT270940	4-pk.	25429	
Wash Seal	Acquity, nanoAcquity	700002598	2-pk.	26429	
Rebuild Kit, Reference Valve	600 Pump	25746	ea.	25492	
Compression Screws, Stainless Steel	Alliance 2690		2-pk.	25493	
Battery	Alliance 2690, 717, 486, 484		ea.	25494	
Seal Pack Rebuild Kit, without Seal Wash Tube Assembly	Alliance 2690	WAT271019	ea.	25495	
717 Seal Pack (Rebuilt) with Needle	717 Autosampler	4559	ea.	25496	
Seal Kit, Pump	616 Pump, 626, 625	31790	ea.	25497	
Cartridge Assembly, Stainless Steel	616 Pump	24960	ea.	25498	

\*Graphite-filled Teflon; best for organic solvents.;

\*\*Ultra-high molecular weight polyethylene (UHMWPE): increased resistance to abrasion, best for buffers.



Kits are convenient and economical, compared to ordering individual items!


**RESTEK**
**CHROMALYTIC** +61(0)3 9762 2034  
ECHnology Pty Ltd

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

**11/12**

 www.restek.com **331**





### ASI Piston Seals for Agilent HPLC Systems

Over time the piston seal in every HPLC system becomes worn and must be replaced. Our piston seals are constructed of Teflon® material with an additive that reduces their tendency to “cold flow” and improves their wear characteristics. Teflon® seals are more resistant to any HPLC solvent than UHMWPE seals, but they are less wear-resistant and rugged. For Agilent 1050 and 1100 HPLC systems.

Description	Similar to Agilent part #	qty.	cat.#	price
ASI Piston Seal	5062-8516	ea.	25175	
ASI Piston Seal		10-pk.	25176	



### ASI Check Valves

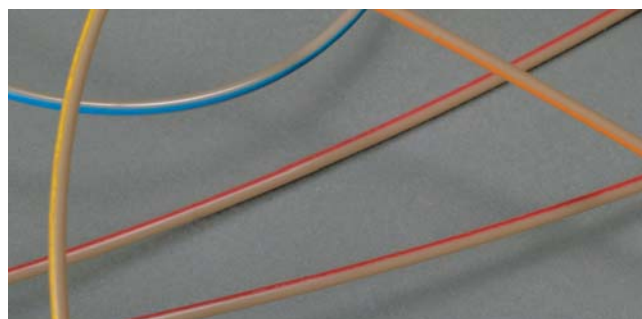
ASI subjects each valve to a rigorous series of tests, including self-priming capability, which means you typically won't need a syringe or draw-off valves to prime your pump. A high-pressure test ensures that the valve will not leak, even at pressures up to 12,000 psi (82,737 kPa). A low-pressure test verifies that the valve closes properly, even without a high backpressure force. The cartridge design allows easy, convenient replacement of worn or damaged valves.

#### for Agilent 1050 & 1100

Description	Material	qty.	cat.#	price
Outlet Check Valve (cartridge and housing)	Sapphire & Ruby Ball & Seat	ea.	25170	
Outlet Check Valve (cartridge and housing)	Ceramic Ball & Seat	ea.	25173	
Outlet Cartridge	Sapphire & Ruby Ball & Seat	ea.	25171	
Outlet Cartridge	Ceramic Ball & Seat	ea.	25174	
Outlet Housing	—	ea.	25172	

#### for Waters Alliance® Model 2690 & 2695

Description	Material	qty.	cat.#	price
Inlet and Outlet Cartridges	Sapphire & Ruby Ball & Seat	ea.	25160	
Inlet and Outlet Cartridges	Ceramic Ball & Seat	ea.	25162	



### Inert PEEK™ Tubing

- Replaces stainless steel, titanium, Teflon® or Tefzel® tubing.
- Less oxygen permeable and more temperature resistant (to 250 °C) than Teflon® or Tefzel® tubing.
- Use with PEEK™ fingertight or flangeless fittings.
- Use to 7,000 psi (48,263 kPa).

Description	OD	ID	Length	Color Code	qty.	cat.#	price
PEEK Tubing	1/16"	0.0025"	1m	pink dash stripe	3-pk.	25320	
PEEK Tubing	1/16"	0.005"	3m	red stripe	ea.	25065	
PEEK Tubing	1/16"	0.007"	3m	yellow stripe	ea.	25066	
PEEK Tubing	1/16"	0.010"	3m	blue stripe	ea.	25067	
PEEK Tubing	1/16"	0.020"	3m	orange stripe	ea.	25068	



### HPLC Stainless Steel Capillary Tubing

- 316 grade stainless steel.
- Precise pre-cut lengths.
- Smooth surface finish.
- Ultra clean.

Whether you need to replace system tubing as part of your troubleshooting or want to reduce the dwell volume of your system as you move to narrower columns, Restek has the quality tubing in the lengths and IDs you need. Each ID is color-coded so it is easy to identify and replace correctly.

		0.005" ID (red)		0.007" ID (gray)		0.010" ID (blue)		0.020" ID (yellow)	
Length	qty.	cat.#	price	cat.#	price	cat.#	price	cat.#	price
1/16" OD Tubing									
5cm	3-pk.	25240		25244		25248	\$17	25252	
10cm	3-pk.	25241		25245		25249	\$20	25253	
20cm	3-pk.	25242		25246		25250	\$23	25254	
30cm	3-pk.	25243		25247		25251	\$26	25255	



### Teflon® Tubing

- Ideal for mobile phase inlet lines.
- Chemically inert.
- Use to 500 psi (3,447 kPa) and 80 °C.

Description	OD	ID	Length	qty.	cat.#	price
Teflon Tubing	1/8"	0.063" (1.6mm)	3m	3m	25306	
Teflon Tubing	1/8"	0.094" (2.4mm)	3m	3m	25307	



### Tubing Clip

Securely holds 1/16-inch or 1/8-inch tubing in beaker, flask, or bottle up to 4 mm thick.

Description	qty.	cat.#	price
Tubing Clip	5-pk.	25310	



### PEEK™ Tubing Elbows

Tubing Elbows (90° and 180°) are ideal for routing 1/16-inch PEEK™ tubing through your system. Simply snap the tubing into the elbow. Prevent pinching of PEEK™ tubing which can cause high pressure.

Description	qty.	cat.#	price
PEEK Tubing Elbow, 90°	5-pk.	25308	
PEEK Tubing Elbow, 180°	5-pk.	25309	



20188

### Tubing Dressing Tool

Opens stainless steel tubing bore and removes burrs. For 1/16-inch OD tubing or 1/8-inch OD 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	



25069

### Clean-Cut Tubing Cutter

- Burr-free, perpendicular cuts that will not distort the tubing OD or close the ID.
- Use on PEEK™, Teflon®, Tefzel®, other polymeric tubing.

Description	qty.	cat.#	price
Clean-Cut Tubing Cutter	ea.	25069	
Replacement Blade for Clean-Cut Cutter	ea.	25070	

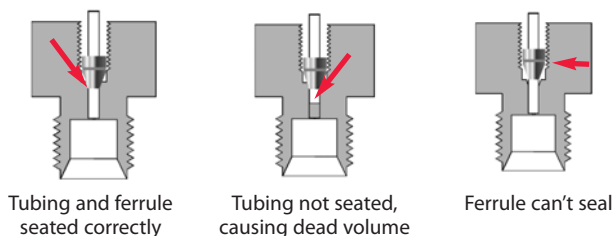
For stainless steel tubing cutters, see page 324 or visit [www.restek.com](http://www.restek.com).

### Improving Column Connections

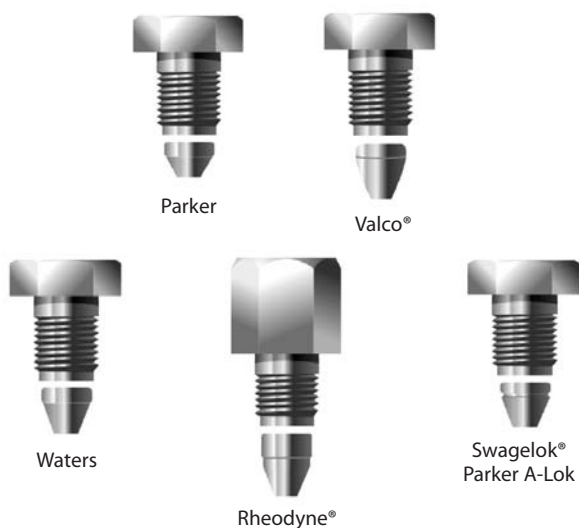
A good connection is necessary for trouble-free chromatography. Connecting incompatible fittings from different manufacturers can result in leaks, poor peak shape, and increased void volume (Figure 1). Each type of end-fitting has a unique seat depth or style. Generally, Restek, Valco®, Parker, and Upchurch Scientific® fittings are interchangeable; whereas Waters, SSI, Rheodyne®, and Gasukura fittings are not (Figure 2).

Our wrenchless universal 10-32 PEEK™ Column Connector (cat.# 25015) can be used with any style of end fitting, and all 1/16-inch tubing. It is reusable and will adjust to any seat, depth, or style, allowing tubing to adjust to depth of hole.

**Figure 1** Incompatible fittings create problems.



**Figure 2** Fitting styles differ among various manufacturers.



25015

Universal 10-32 PEEK™  
Column Connector  
works with any style of  
end fitting!



25015

Use with any style  
of end fitting!

25324

### Universal 10-32 PEEK™ Column Connectors and Plugs

Universal PEEK™ Connectors allow easy installation of all 1/16-inch tubing, including stainless steel.

Description	qty.	cat.#	price
PEEK Column Connector (beige, round body)	10-pk.	25015	
PEEK Column Plug (black)	10-pk.	25016	
PEEK Fingertight Fittings (blue, flat-sided)	10-pk.	25324	



25095

25096

### Rheodyne® Style Nut and Ferrule

Replacement long nut for connecting stainless steel tubing to a Rheodyne® 6-port valve or other Rheodyne® part.

Description	qty.	cat.#	price
1/16" Rheodyne Style Nut	10-pk.	25095	
1/16" Rheodyne Style Ferrule	10-pk.	25096	

## ChromaBLOGraphy

Topical and timely insights from top chromatographers.

Visit us at [blog.restek.com](http://blog.restek.com)



### PEEK™ Union Connector

Quickly and reliably connect two pieces of 1/16-inch tubing. 0.3 mm union bore. End fittings included.

Description	qty.	cat.#	price
PEEK Union Connector 1/16"	2-pk.	25323	



20147

### 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	



Ensure a  
consistent,  
leak-free seal!

PEEK™  
Secure-Fit Fitting

Stainless Steel  
Secure-Fit Fitting

### Secure-Fit Fittings

A good connection between HPLC components is necessary for trouble-free chromatography. Secure-Fit connectors from Restek and Selerity Technologies ensure a consistent, leak-free seal—and they eliminate excess dead volume! An internal spring mechanism holds the capillary tubing at the proper depth in the female fitting. This seal is maintained while you finger-tighten the nut. These fittings are available in stainless steel or PEEK™, and in a variety of tubing lengths and internal diameters.

### Secure-Fit Fittings (Single Connectors)

Length	Stainless Steel			PEEK			price
	0.005" ID	0.007" ID	0.010" ID	0.005" ID	0.007" ID	0.010" ID	
6cm	25181	25185	25190	25230	25234	25217	
10cm	25182	25186	25191	25231	25235	25218	
20cm	25183	25187	25192	25232	25236	25219	
30cm	25184	25188	25193	25233	25237	25220	
50cm	26510	26511	26512	—	—	—	

### Secure-Fit Fittings (Two Connectors)

Length	Stainless Steel			PEEK			price
	0.005" ID	0.007" ID	0.010" ID	0.005" ID	0.007" ID	0.010" ID	
10cm	25208	25211	25214	25221	25224	25227	
20cm	25209	25212	25215	25222	25225	25228	
30cm	25210	25213	25216	25223	25226	25229	
50cm	26513	26514	26515	—	—	—	



### Ferrules for Secure-Fit (1/16")

Description	Material	qty.	cat.#	price
1/16" Ferrule for Secure-Fit	PEEK	10-pk.	20568	
1/16" Ferrule for Secure-Fit	Stainless Steel	10-pk.	25043	





25322



Kits are convenient and economical, compared to ordering individual items!



25097

### Survival Kit for HPLC, PEEK™

The PEEK™ Survival Kit is an invaluable parts kit that contains tubing, fittings, and tools essential for setting up and maintaining your HPLC system: PEEK™ tubing, connectors, and elbows, Teflon® tubing, a tubing cutter and extra blades, a ValvTool wrench, open-end wrenches, and more.

#### For start-up and maintenance in all HPLC systems.

Description	qty.	cat.#	price
Survival Kit for HPLC, PEEK	kit	25322	
<b>Contents:</b>			
Description	qty.	cat.#	price
PEEK Column Connector (beige, round body)	10-pk.	25015	
PEEK Tubing, 1/16" OD x 0.005" ID x 3m (red stripe)	ea.	25065	
PEEK Tubing, 1/16" OD x 0.007" ID x 3m (yellow stripe)	ea.	25066	
PEEK Tubing, 1/16" OD x 0.010" ID x 3m (blue stripe)	ea.	25067	
PEEK Tubing Elbow, 90°	5-pk.	25308	
PEEK Tubing Elbow, 180°	5-pk.	25309	
Teflon Tubing, 1/8" OD x 0.063" (1.6mm) ID x 3m	3m	25306	
Teflon Tubing, 1/8" OD x 0.094" (2.4mm) ID x 3m	3m	25307	
Tubing Clip	5-pk.	25310	
ValvTool Wrench	ea.	25321	
Open-End Wrenches, 1/4" x 5/16"	2-pk.*	20110	
Clean-Cut Tubing Cutter	ea.	25069	
Replacement Blade for Clean-Cut Cutter	ea.	25070	
PEEK Union Connector 1/16"	2-pk.	25323	
Mobile Phase Spurge Filter: 2µm	ea.	25311	
Inlet Filter: 10µm	ea.	25312	

\*Kit contains 1 wrench, replacement (cat.# 20110) is a 2-pk.

### HPLC PEEK™ Performance Kit

This HPLC PEEK™ Performance Kit is a useful complement to your HPLC system. Includes:

- Hub-Cap Adapter w/Cap (1)
- Tubing Clips (3)
- Clean Cut Tubing Cutter (1)
- PEEK Finger Tight Fittings (5)
- PEEK Column Plugs (5)
- PEEK 90° Tubing Elbows (2)
- PEEK 180° Tubing Elbows (2)
- PEEK Column Connectors (2)



Description	qty.	cat.#	price
HPLC PEEK Performance Kit	kit	26394	

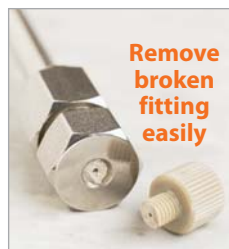
### Survival Kit for HPLC, Stainless Steel

The stainless steel survival kit contains a wide range of tubing, fittings, and tools necessary to set up and maintain your HPLC system: a selection of lengths and IDs of 1/16-inch tubing, plus nuts, ferrules, a ValvTool wrench, and a zero-dead-volume union.

Description		qty.	cat.#	price
Survival Kit for HPLC, Stainless Steel		kit	25097	
<b>Contents:</b>				
Description	color	qty.	cat.#	price
HPLC Capillary Tubing, SS, 1/16" x 0.005" x 5cm	red	3-pk.	25240	
HPLC Capillary Tubing, SS, 1/16" x 0.005" x 10cm	red	3-pk.	25241	
HPLC Capillary Tubing, SS, 1/16" x 0.005" x 20cm	red	3-pk.	25242	
HPLC Capillary Tubing, SS, 1/16" x 0.005" x 30cm	red	3-pk.	25243	
HPLC Capillary Tubing, SS, 1/16" x 0.007" x 5cm	gray	3-pk.	25244	
HPLC Capillary Tubing, SS, 1/16" x 0.007" x 10cm	gray	3-pk.	25245	
HPLC Capillary Tubing, SS, 1/16" x 0.007" x 20cm	gray	3-pk.	25246	
HPLC Capillary Tubing, SS, 1/16" x 0.007" x 30cm	gray	3-pk.	25247	
HPLC Capillary Tubing, SS, 1/16" x 0.010" x 5cm	blue	3-pk.	25248	
HPLC Capillary Tubing, SS, 1/16" x 0.010" x 10cm	blue	3-pk.	25249	
HPLC Capillary Tubing, SS, 1/16" x 0.010" x 20cm	blue	3-pk.	25250	
HPLC Capillary Tubing, SS, 1/16" x 0.010" x 30cm	blue	3-pk.	25251	
HPLC Capillary Tubing, SS, 1/16" x 0.020" x 5cm	yellow	3-pk.	25252	
HPLC Capillary Tubing, SS, 1/16" x 0.020" x 10cm	yellow	3-pk.	25253	
HPLC Capillary Tubing, SS, 1/16" x 0.020" x 20cm	yellow	3-pk.	25254	
HPLC Capillary Tubing, SS, 1/16" x 0.020" x 30cm	yellow	3-pk.	25255	
1/16" Rheodyne Style Nut		10-pk.	25095	
1/16" Rheodyne Style Ferrule		10-pk.	25096	
ValvTool Wrench		ea.	25321	
Ferrules, 1/16" Stainless Steel		10-pk.	26548	
Nuts, 1/16" Stainless Steel		10-pk.	20287	
Zero-Dead-Volume Internal Union		ea.	20148	



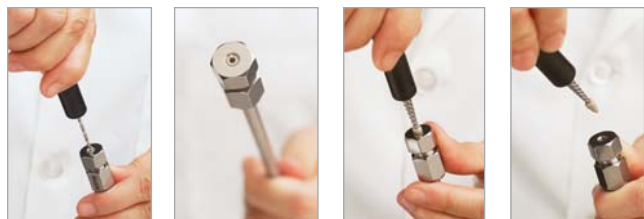
25325



Remove  
broken  
fitting  
easily

### PEEK™ Fitting Extractor

Drill into the broken fitting, then screw the extractor into the fitting and remove it easily. Eliminates the need for heat or other techniques that could damage your column.



Description	qty.	cat.#	price
PEEK Fitting Extractor	ea.	25325	



25321

### ValvTool Wrench

The ValvTool is a time-saving device that provides easy access to many hard-to-reach Rheodyne® or Valco® valves. For 1/4-inch nuts.

Description	qty.	cat.#	price
ValvTool Wrench	ea.	25321	

Use the flat  
side of the  
Piston Seal  
Insertion Tool  
to seat a  
Waters face  
seal.



### HPLC Piston Seal Insertion Tool

Simplify pump maintenance: use one end to remove your old seal, then simply slip your new seal on the other end and push it flush into position. The tool cannot mar the surrounding metal surface of the pump housing.



Remove a seal



Seat a seal



Description	qty.	cat.#	price
HPLC Piston Seal Insertion Tool	ea.	21356	

### Outlet Cap and Gold Seal Assembly Tool for Agilent 1050 & 1100 HPLC Systems

Easily install the gold seal into the outlet cap.



Put Outlet Cap on  
male part of  
Assembly Tool.

Push the Assembly  
Tool together, then  
hold on to Outlet Cap  
and pull Assembly  
Tool apart.

Put Gold Seal over pin  
on male part of  
Assembly Tool.

Push the Assembly  
Tool together and  
press the Gold Seal in  
the Outlet Cap.

Pull the Assembly  
Tool together and  
remove  
assembled Outlet Cap  
and Gold Seal.

Description	qty.	cat.#	price
Outlet Cap and Gold Seal Assembly Tool for Agilent 1050 & 1100 HPLC Systems	ea.	24989	
Seal, Gold Disk (outlet)	ea.	25467	
Outlet Cap	4-pk.	25139	
Outlet Cap & Gold Seal Assembly	2-pk.	25140	



25140



Now available for  
GL-45 bottles!



Bottles not included

### Waste Overflow Indicator

- Avoid messy pooling around mobile phase waste containers.
- Audible alarm instantly alerts user, preventing overflow.
- Compact, battery operated unit.
- Available for 4-liter and GL-45 solvent bottles.

The Restek Waste Overflow Indicator will help keep your mobile phase waste where it belongs—in the waste container! Compact, battery operated unit fits securely on solvent bottles and accommodates two waste streams. An audible alarm is given as the solvent waste container approaches capacity, giving you time to empty or change the container. Another innovative design from Restek!

Description	qty.	cat.#	price
Waste Overflow Indicator for HPLC Systems, 4 Liter	ea.	26543	
Waste Overflow Indicator for HPLC Systems, GL-45	ea.	26550	
Replacement AA Battery for the Waste Overflow Indicator	ea.	26544	
Replacement AA Batteries for the Waste Overflow Indicator	3-pk.	26545	

### Opti-Cap® Bottle Top

The most economical way to helium-sparge and deliver HPLC mobile phases.

The Opti-Cap® top fits all standard GL-45 bottles and has two 1/8-inch holes and one 1/16-inch hole for tubing. All three openings are designed for threaded PEEK™ plugs



Bottle not included.

Description	qty.	cat.#	price
Opti-Cap (Cap and PEEK Plug)	ea.	25300	
Opti-Cap Kit			
(Opti-Cap, 3 meters of tubing, sparging filters)	kit	25301	
Opti-Cap Kit with 1L Bottle	kit	25302	
Opti-Cap Kit with 2L Bottle	kit	25303	
<b>Related items and replacement parts</b>			
	qty.	cat.#	price
Mobile Phase Sparge Filter: 2µm, stainless steel	ea.	25311	
Mobile Phase Inlet Filter: 10µm	ea.	25312	
Teflon Tubing, 1/8" OD x 0.094" (2.4mm) ID x 3m	3m	25307	
Teflon Tubing, 1/8" OD x 0.063" (1.6mm) ID x 3m	3m	25306	
PEEK Plug, 1/4"-28 threads	3-pk.	25319	
1L Graduated Safety-Coated Bottle – GL-45 threads	ea.	25304	
2L Graduated Safety-Coated Bottle – GL-45 threads	ea.	25305	

### Eco-Cap Bottle Top, PTFE

Fits all standard GL-45 bottles; has two 1/8-inch holes and one 1/16-inch hole for tubing. Holes are not threaded.



Description	qty.	cat.#	price
Eco-Cap Bottle Top, includes 1 Male Luer Plug	ea.	25395	



27197



26551

### Opti-Cap® Adapters

Allow the use of the Hub-Cap with GL-45 solvent bottles.

Description	qty.	cat.#	price
Opti-Cap Adapter	ea.	27197	
Opti-Cap Adapter Multi-pack	3-pk.	27198	
Opti-Cap Adapter w/Hub-Cap	kit	26551	





### Hub-Cap 4 Liter Bottle Tops

Hub-Cap bottle tops are a great way to neatly keep your mobile phase lines where they belong. Use instead of parafilm, aluminum foil, or tape on your mobile phase reservoirs.



Description	qty.	cat.#	price
Hub-Cap (assembly of the bottle cap and plug)	kit	26541	
Hub-Cap Multi-pack	3-pk.	26542	



### Hub-Cap Adapters

Allow the use of the Opti-Cap™ with 4-liter solvent bottles.

Description	qty.	cat.#	price
Hub-Cap Adapter	ea.	26538	
Hub-Cap Adapter Multi-pack	3-pk.	26539	
Hub-Cap Adapter and Opti-Cap	kit	26540	



### Mobile Phase Additives

Mobile phase additives such as triethylamine, trifluoroacetic acid, and ion-pairing reagents can compete with sample ions, decreasing sensitivity and, in some cases, reducing sample ion intake into the MS. To obtain symmetric peaks and/or sufficient retention, use base deactivated, state-of-the-art Type B silica packings that minimize the need for additives.

## Transfer and filter mobile phase in a single step!



26395



Polypropylene  
Membrane Filters

### Hub-Cap Filter Kit

Kit includes: bottle adapter, bottle adapter nut, filter inlet cap, grid support, vacuum hose barb, tube compression fitting, 47 mm grid, 47 mm 0.22 µm filter membrane, 47 mm 0.45 µm filter membrane, 1/4" OD x 1/8" ID ultra chemical resistant, Teflon® FEP lined Tygon® tubing (3'), 6" x 6" box with shrink wrap insert. Includes universal threads designed for 4L or Wheaton bottles.



Bottle not included.

### Assembles quickly and easily!



Unscrew and lift off top.



Place membrane filter on top of grid.



Reattach top.



Connect vacuum line to side port.

Description	qty.	cat.#	price
Hub-Cap Filter Kit for 4L or Wheaton bottles	kit	26395	
<b>Replacement Membrane Filters</b>			
	qty.	cat.#	price
Polypropylene Membrane Filters, 47mm, 0.45µm	100-pk.	26396	
Polypropylene Membrane Filters, 47mm, 0.22µm	100-pk.	26397	
Nylon Membrane Filters, 47mm, 0.45µm	100-pk.	26398	
Nylon Membrane Filters, 47mm, 0.22µm	100-pk.	26399	



**FlatLine Pulse Damper**

- Rupture-proof, no diaphragm—minimal risk of failure or leaks.
- Clean flush-out design—no sample carryover.
- Low internal volume—negligible effect on analyte bandwidth.



25340

The ASI FlatLine Pulse Damper combines performance and reliability in a simple, easy-to-use housing. Standard 10-32 inlet and outlet ports allow quick connection into virtually any HPLC system. Solid core technology provides reliable long-term operation without the downtime associated with ruptured or leaking membrane dampers. 600–700  $\mu\text{L}$  internal volume at ambient pressure. Maximum pressure: 6,000 psi (41,369 kPa)

Description	qty.	cat.#	price
FlatLine Pulse Damper, 1.5" W x 3.75" L	ea.	25340	

**MiniPulse Pulse Damper**

- Compact unit (2.5" x 1.5") can be placed almost anywhere.
- Small, 160  $\mu\text{L}$  dead volume at atmospheric pressure.
- PEEK™ unit can withstand pressures to 5,000 psi (34,474 kPa).
- 316 Stainless steel unit can withstand pressures to 6,000 psi (41,369 kPa).



25238

Improves system baseline stability while increasing the total system volume by only 160  $\mu\text{L}$ . The MiniPulse pulse damper is ideal for applications where minimizing the total system volume is critical. Stainless steel and PEEK™ options for a wide range of applications.

Description	qty.	cat.#	price
MiniPulse Pulse Damper, Stainless Steel	ea.	25238	
MiniPulse Pulse Damper, PEEK	ea.	25239	



25013

**LO-Pulse Pulse Damper**

The LO-Pulse Pulse Damper is a patented, wide-dynamic-range 316 stainless steel device that smooths pulsations and maintains constant flow at system pressures from 500 to 6,000 psi (3,447 to 41,369 kPa). The flow path volume is only 0.9 mL and the path is efficiently swept, eliminating solvent memory effects when changing mobile phases.

The LO-Pulse pulse damper also is available in a space-saving, economical kit that includes hardware for mounting the pulse damper on a bracket, or for installing feet on it for bench-top use.

Description	qty.	cat.#	price
Model LP-21 LO-Pulse Pulse Damper	ea.	25012	
Pulse Damper Kit	kit	25013	

**UHP Pulse Dampener**

The UHP Pulse Dampener provides minimal flow pulsation at system pressures up to 18,000 psi. Its low dead volume (220  $\mu\text{L}$  at atmospheric pressure) reduces overall system volume for UHP applications. The UHP Pulse Dampener has a stainless steel fluid path.



NEW!

**Specifications:**

Operating Pressure:	0–18,000psi
Pulsation Damping:	3:1 reduction in pulsation (dependent on pump characteristics and system volume and pressure)
Fluid Path Volume:	220 $\mu\text{L}$ (atmospheric pressure) +44 $\mu\text{L}$ (per 1,000psi system pressure)
Wetted Materials:	316 SS; PTFE; Teflon
Dimensions:	2.5" diameter x 2.0" high

Description	qty.	cat.#	price
UHP Pulse Dampener	ea.	26549	

**Solvent Debubbler**

Bubbles in an HPLC system can cause check valve malfunctions and pump cavitation, seriously affecting pump performance. The debubbler removes bubbles from the fluid stream before it enters the pump.



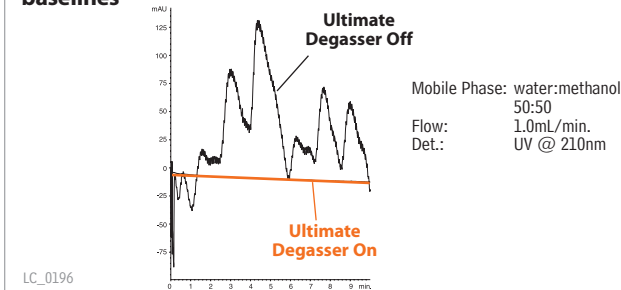
25014

Special geometry at the base of the housing allows bubbles entrained in the inlet fluid stream to rise and be trapped in the reservoir. The gas/liquid interface is easily visible through the translucent wall of the device. Loosening the airtight cap releases the trapped gas. The debubbler is fitted with a bracket and universal connecting tips.

Description	qty.	cat.#	price
Solvent Debubbler with Bracket	ea.	25014	



### Degasys Ultimate Degasser provides highly stable baselines



To prevent system damage, do not use the Degasys system with solutions containing TFA at concentrations greater than 5%.

### Mobile Phase Degasser

Dissolved oxygen can cause flow rate instability and increased baseline noise. Also, it has a quenching effect on fluorescence detection and increases the background of UV detectors. Dissolved gases can out-gas in the HPLC system, forming bubbles in check valves, at connections, or in detector flow cells.

In-line vacuum degassing is more effective at removing dissolved gas from mobile phases than sonication or helium sparging. In-line degassers work by withdrawing gas across a gas-permeable membrane encased in a sealed chamber. Traditionally, the membrane has been made of PTFE tubing, but the Degasys Ultimate Degasser uses tubing composed of an amorphous fluoropolymer that is 200 to 300 times more gas permeable than PTFE. This translates into the ability to use shorter tubing for removing dissolved gas. This new material also has better tubular burst strength than PTFE. To prevent cross contamination, each channel on this Degasys unit is individually encased within its own vacuum chamber.

#### Specifications:

<b>Residual Oxygen<sup>1</sup></b>	0.9ppm
<b>Pressure Loss<sup>1</sup></b>	0.24psi (1.65kPa)
<b>Internal Volume</b>	500µL

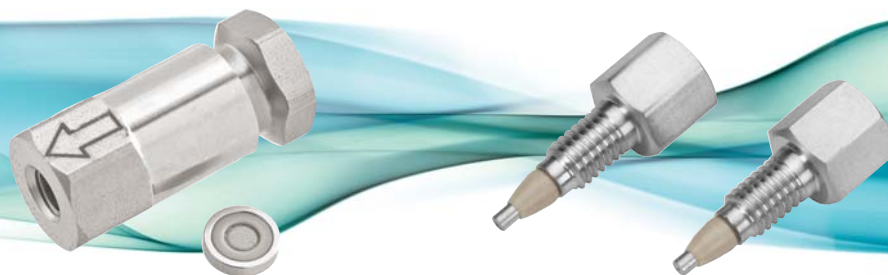
<sup>1</sup>At a flow rate of 1mL/min.

<b>Wetted Parts</b>	Teflon AF, PTFE, ETFE, PPS
<b>Max Flow Rate</b>	7mL/min./channel

Description	Voltage	qty.	cat.#	price
Mobile Phase Degasser (4 Channel, 7mL/min./channel)	110V	ea.	25189	
Mobile Phase Degasser (4 Channel, 7mL/min./channel)	220V	ea.	25194	

## Protect your column and system performance with UltraShield and UltraLine UHPLC Filters

A cost-effective way to extend the lifetime of any UHPLC column without sacrificing UHPLC performance



See page 195 for details.



### Low-Pressure Slip-On Inlet Filter for Mobile Phase Reservoir

A type 316 stainless steel tip with a Tefzel® collar seals to a corrosion-resistant type 316 stainless steel filter element. The slip-on filter easily attaches to the pump inlet line, without the use of wrenches. The universal tip accommodates standard Teflon® tubing inner diameters. The cylindrical filter is standard 10 µm porosity. 1/8" OD. Fits Altex, ISCO, LDC, Varian, Waters, PerkinElmer, and other pumps.

Description	qty.	cat.#	price
Slip-on Inlet Filter	ea.	25008	



### Low-Pressure CPI Inlet Filter for Mobile Phase Reservoir

A 316 stainless steel knurled cap and Tefzel® CPI ferrule seal to 1/8" OD Teflon® tubing when finger-tightened onto the precision-machined filter holder. The filter element is replaceable. Standard 10 µm porosity protects delicate pump components from particles but introduces very little pressure drop. 1/8" OD. May be used as a helium sparging diffuser.

Description	qty.	cat.#	price
CPI Inlet Filter	ea.	25009	
Replacement Elements: 10µm filter	2-pk.	25010	



also  
available

**Trident Direct high-pressure filter—**  
protection against particulate matter.  
See **page 197** for details.

### Mobile Phase Spurge Filter; Inlet Filter

The 2 µm helium spurge filter is an inexpensive way to prepare and maintain mobile phases free of dissolved gas. Both filters are made from 316 stainless steel and PEEK™ and are compatible with most solvents.



Description	qty.	cat.#	price
Mobile Phase Spurge Filter: 2µm	ea.	25311	
Inlet Filter: 10µm	ea.	25312	
Inlet Filter: 20µm	ea.	25313	

### Last Drop Filter

The flat filter element sits parallel to the bottom of the mobile phase reservoir, allowing the filter to draw 98% of the mobile phase without drawing air into the system. Conventional cylindrical mobile phase filters begin to draw air into the system when approximately 10% of the solvent remains in the reservoir. The Last Drop Filter allows more analyses per batch of mobile phase and helps reduce hazardous waste. 22.1 mm OD.



Description	qty.	cat.#	price
Last Drop Filter, 2µm	ea.	25314	
Last Drop Filter, 10µm	ea.	25315	





KT953825-0000



Polypropylene  
Membrane Filters

### Membrane Microfiltration Glassware

47 mm filtration apparatus with fritted glass support is recommended for routine filtration of corrosive liquids and removal of particles from HPLC solvents. The ground joint connection eliminates phthalate contamination that can occur when using silicone or neoprene stoppers. The support base has a coarse porosity glass frit and an integral vacuum connection, located above the drip tip to prevent contamination of the vacuum line with filtrate droplets. Each apparatus includes a funnel, an anodized aluminum clamp, a 47 mm fritted glass support base, and a filtration flask.

All-Glass Microfiltration Apparatus	qty.	cat.#	price
300mL Funnel, 1000mL Flask	ea.	KT953825-0000	
500mL Funnel, 2000mL Flask	ea.	KT953835-0000	
1000mL Funnel, 4000mL Flask	ea.	KT953845-0000	
Replacement Parts for Microfiltration Apparatus	qty.	cat.#	price
40/35 PTFE Joint Sleeve	6-pk.	KT676001-4035	
Flask Cap, 40/35 Outer Joint	ea.	KT953830-0000	
Fritted Glass Support, 47mm, 40/35 Joint	ea.	KT953826-0000	
Glass Funnel, 47mm, 100mL	ea.	KT953761-0000	
Glass Funnel, 47mm, 300mL	ea.	KT953751-0000	
Glass Funnel, 47mm, 500mL	ea.	KT953771-0000	
Glass Funnel, 47mm, 1000mL	ea.	KT953781-0000	
Flask, 1000mL, 40/35 Joint	ea.	KT953827-0000	
Flask, 2000mL, 40/35 Joint	ea.	KT953828-0000	
Flask, 4000mL, 40/35 Joint	ea.	KT953829-0000	
Aluminum Clamp, 47mm	ea.	KT953753-0000	
Membrane Filters	qty.	cat.#	price
Polypropylene Membrane Filters, 47mm, 0.45µm	100-pk.	26396	
Polypropylene Membrane Filters, 47mm, 0.22µm	100-pk.	26397	
Nylon Membrane Filters, 47mm, 0.45µm	100-pk.	26398	
Nylon Membrane Filters, 47mm, 0.22µm	100-pk.	26399	



26516



### Sidewinder Column Heater

- Easy to set up!
- Operation range: 5 °C above ambient to 85 °C,  $\pm 1$  °C.
- Lightweight, compact design fits in small spaces.
- Column holder can be placed in any orientation.

This unique design completely encloses any HPLC analytical column up to 25 cm in length. Two lengths of heater jackets are available: the short column holder accommodates columns up to 10 cm in length, while the long column holder holds columns up to 25 cm in length. The control module provides optimum heating performance, accuracy to within 1 °C, and stability to within 0.1 °C. The new Sidewinder controller has fast 10 Hz sampling for improved responsiveness. Power requirements: 24 V control unit for maximum stability; RS232 control allows external programming.

Description	Length	qty.	cat.#	price
Temperature Control Module and Column Holder	Long (25cm)	ea.	26516	
Temperature Control Module and Column Holder	Short (10cm)	ea.	26517	



26518



### Sidewinder Heater/Cooler Temperature Control Module

- Operation range: 5-55 °C,  $\pm 0.2$  °C.
- Ability to program multiple temperature points.
- Accommodates columns up to 30 cm in length and 7.8 mm ID.
- Compact design.

The Sidewinder heater/cooler unit has a doubly insulated cover to maintain the programmed temperature to within 0.2 °C. The 24 V control unit provides maximum stability and rapid equilibration times; RS232 control allows external programming.

Description	qty.	cat.#	price
Sidewinder Heater/Cooler Temperature Control Module	ea.	26518	



22484



### Mobile Phase Pre-Heater

- Heats mobile phase before it enters a heated column.
- Minimizes temperature changes, to help keep analyte peaks sharp.

Description	qty.	cat.#	price
15µL Mobile Phase Pre-heater, 0.010" ID	ea.	22484	





25328



25336

### QuickSplit Post-Column Flow Splitters

Fluid resistor technology eliminates adjustments to capillary tubing for optimizing split ratio. Wide range of interchangeable resistors available.

### Fixed Flow Splitters for HPLC & LC/MS

- Split ratio not affected by changes in viscosity or pressure.
- High operating pressure limit: 10,000 psi (68,948 kPa).
- Low dead volume—negligible effect on analyte bandwidth.
- Total flow: 0.1–5.0 mL/min.

### Adjustable Flow Splitter

- Adjustable metering valve gives convenient control of split ratio.
- Split ratio not affected by changes in viscosity or pressure.
- High operating pressure limit: 5,000 psi (34,474 kPa).
- Low dead volume—negligible effect on analyte bandwidth.
- Total flow: 0.1–5.0 mL/min.

Description	Split Ratio	qty.	cat.#	price
Binary Fixed, Post Column	100:1	ea.	25326	
	50:1	ea.	25327	
	20:1	ea.	25328	
	10:1	ea.	25329	
	5:1	ea.	25330	
Replacement Fixed Resistor Set, Post Column	100:1	ea.	25331	
	50:1	ea.	25332	
	20:1	ea.	25333	
	10:1	ea.	25334	
	5:1	ea.	25335	
Adjustable, Post Column	5:1 to 100:1	ea.	25336	
	1:1 to 20:1	ea.	25337	
	50:1 to 1000:1	ea.	26416	
Replacement Adjustable Resistor Set, Post Column	5:1 to 100:1	ea.	25338	
	1:1 to 20:1	ea.	25339	



25342

### HPLC Mixers

- Reduced baseline noise.
- Increased sensitivity.
- Improved gradient accuracy, for more reproducible results.
- Increased reaction efficiency in post-column derivatization.

An efficient cross-flow shearing mechanism and interchangeable cartridges produce vortex shear mixing over a wide range of flows. Stainless steel or PEEK™.

### HyperShear™ Static In-Line Mixers

Volume	Stainless Steel			PEEK		
	qty.	cat.#	price	qty.	cat.#	price
1µL	ea.	26409	\$510	ea.	26410	
25µL	ea.	26411	\$605	ea.	26412	
50µL	ea.	25341	\$605	ea.	26413	
150µL	ea.	25342	\$605	ea.	26414	
250µL	ea.	25343	\$605	ea.	26415	



25138

### Ternary Tee Mixer

Description	Volume	qty.	cat.#	price
Ternary Tee Mixer	25µL	ea.	25138	

## Valves, Backpressure Regulators



## Backpressure Regulators

Backpressure regulators can improve detector performance by preventing bubble formation in the detector flow cell. They also are useful in post-column reaction lines and between detectors and fraction collectors in preparatory work. Regulators are superior to more specific alternative solutions, like small-bore tubing, in which pressure varies with flow rate.

Our end-of-line and flow-through backpressure regulators are adjustable to assure constant backpressure over a wide range of mobile-phase viscosities and flow rates. The end-of-line model is available with 1/4-28 plastic flange-type fittings or high-pressure 1/16-inch compression fittings; this design adjusts from 15 to 60 psi (103 to 414 kPa). The flow-through design has 1/16-inch compression fittings and is adjustable from 7 to 75 psi (48 to 517 kPa).

## Valves for HPLC

Our valves have low internal volumes and are rated to 15,000 psi (103,421 kPa). They feature a 2-piece stem assembly in which the rotating upper shank is coupled through a ball joint to a static lower stem. Only fingertight torque is required to make the seal.

Description	qty.	cat.#	price
Two-Way Through Valve for HPLC, 1/16" Fittings, 1/4-28, Stainless Steel, Includes Nuts and Ferrules	ea.	26400	
Two-Way Angle Valve for HPLC, 1/16" Fittings, 1/4-28, Stainless Steel, Includes Nuts and Ferrules	ea.	26401	
Three-Way Bottom Vent Valve for HPLC, 1/16" Fittings, 1/4-28, Stainless Steel, Includes Nuts and Ferrules	ea.	26402	
Side Vent Valve for HPLC, 1/16" Fittings, 1/4-28, Stainless Steel, Includes Nuts and Ferrules	ea.	26403	
Dual Stem Three Way Valve for HPLC, 1/16" Fittings, 1/4-28, Stainless Steel, Includes Nuts and Ferrules	ea.	26404	
Prime/Purge Valve for HPLC, 1/4-28 Flanged Seat, Stainless Steel, with Tubing and Fittings	ea.	26406	
Prime/Purge Valve Repair Kit for Prime/Purge Valve	kit	26407	



## In-Line Check Valves for HPLC

Description	Max Pressure	qty.	cat.#	price
Check Valve, Soft Seat, for HPLC, 1/16" Fittings, 1/4-28, Stainless Steel, Includes Nuts and Ferrules	15,000psi	ea.	26405	
Check Valve with 1/8" Ball Cartridge, 48µL internal volume	15,000psi	ea.	26417	
Check Valve Replacement 1/8" Ball Cartridge, 48µL internal volume	15,000psi	ea.	26418	
UHP Check Valve with 1/8" Ball Cartridge, 48µL internal volume	30,000psi	ea.	26419	
UHP Check Valve Replacement 1/8" Ball Cartridge, 48µL internal volume	30,000psi	ea.	26420	
Check Valve with 3/16" Ball Cartridge, 60µL internal volume	15,000psi	ea.	26421	
Check Valve Replacement 3/16" Ball Cartridge, 60µL internal volume	15,000psi	ea.	26422	

RESTEK

**CHROMALYTIC** +61(0)3 9762 2034  
ECHnology Pty Ltd

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

11/12

www.restek.com 345

### Syringes for Waters U6K Valves

- Reinforced plungers.
- Removable needles.
- Replaceable plunger/barrel assemblies.
- Barrel stop prevents plunger blowout.

#### Hamilton



Volume	Needle Term.	Needle Gauge	Needle Length	Point Style	Hamilton		Restek	price
					Model	cat.#	qty.	
10µL	RN	25s	1.97"	3	801	84815	ea.	21255
25µL	RN	25s	1.97"	3	802	84816	ea.	21256
50µL	RN	25s	1.97"	3	805	84817	ea.	21257
100µL	RN	25s	1.97"	3	810	84818	ea.	21258
250µL	RN	25s	1.97"	3	825	84819	ea.	21259

#### SGE



Volume	Needle Term.	Needle Gauge	Needle Length	Point Style	SGE		Restek	price
					Model	cat.#	qty.	
25µL	R	25	50mm	3	25R-WLC-RA8	003375	ea.	24873
50µL	R	25	50mm	3	50R-WLC-RA8	004375	ea.	24874
100µL	R	25	50mm	3	100R-WLC-RA8	005375	ea.	24875
250µL	R	25	50mm	3	250R-WLC-RA8	006375	ea.	24876
500µL	R	25	50mm	3	500R-WLC-RA8	007375	ea.	24877

### Replacement Needles for Syringes for Waters U6K Valves

#### Hamilton



Syringe Volume	Needle Gauge	Needle Length	Point Style	Hamilton cat.#	Restek cat.#	price
					qty.	
10-100µL	25s	1.97"	3	8647-01	6-pk.	21270
250µL-10mL	25s	1.97"	3	8648-01	6-pk.	21271

## Gas-Tight Syringes for Rheodyne® & Valco® Valves

- Teflon®-tipped plungers.
- Removable needles.
- Replaceable syringe barrels, plungers, and plunger tips.

### Hamilton

Volume	Needle Term.	Needle Gauge	Needle Length	Point Style	Hamilton Model	Hamilton cat.#	qty.	Restek cat.#	price
10µL	RN	26s	2"/51mm	3	1701	80065	ea.	21260	
25µL	RN	22s	2"/51mm	3	1702	80265	ea.	21261	
50µL	RN	22s	2"/51mm	3	1705	80965	ea.	21262	
100µL	RN	22s	2"/51mm	3	1710	81065	ea.	21263	
250µL	RN	22s	2"/51mm	3	1725	81165	ea.	21264	



### SGE

Volume	Needle Term.	Needle Gauge	Needle Length	Point Style	SGE Model	SGE cat.#	qty.	Restek cat.#	price
10µL	R	22	2"	3	10R-GT-LC	002313	ea.	24866	
25µL	R	22	2"	3	25R-GT-LC	003312	ea.	24867	
50µL	R	22	2"	3	50R-GT-LC	004312	ea.	24868	
100µL	R	22	2"	3	100R-GT-LC	005312	ea.	24869	
250µL	R	22	2"	3	250R-GT-LC	006312	ea.	24870	
500µL	R	22	2"	3	500R-GT-LC	007312	ea.	24871	



## Replacement Needles for Gas-Tight Syringes for Rheodyne® & Valco® Valves

### Hamilton

Syringe Volume	Needle Gauge	Needle Length	Point Style	Hamilton cat.#	qty.	Restek cat.#	price
5–100µL	22s	2"	3	7770-01	6-pk.	24941	
250µL–10mL	22	2"	3	7780-04	6-pk.	24945	



### SGE

Syringe Volume	Needle Gauge	Needle Length	Point Style	SGE cat.#	qty.	Restek cat.#	price
10µL	22	2"	3	037250	5-pk.	24808	
25–500µL	22	2"	3	038250	5-pk.	24809	





## Economical Microliter Liquid-Type Syringes for Rheodyne® & Valco® Valves

- Cemented/fixed needles.
- Plungers and barrels are not interchangeable or replaceable.

### Hamilton



21252

Volume	Needle Term.	Needle Gauge	Needle Length	Point Style	Hamilton			Restek	
					Model	cat.#	qty.	cat.#	price
10µL	N	22s	2"	3	701	80365	ea.	21250	
25µL	N	22s	2"	3	702	80465	ea.	21251	
50µL	N	22s	2"	3	705	80565	ea.	21252	
100µL	N	22s	2"	3	710	80665	ea.	21253	
250µL	N	22s	2"	3	725	80765	ea.	21254	

### SGE



24860

Volume	Needle Term.	Needle Gauge	Needle Length	Point Style	SGE			Restek	
					Model	cat.#	qty.	cat.#	price
10µL	F	22	2"	3	10F-LC	002301	ea.	24860	
25µL	F	22	2"	3	25F-LC	003300	ea.	24861	
50µL	F	22	2"	3	50F-LC	004300	ea.	24862	
100µL	F	22	2"	3	100F-LC	005300	ea.	24863	
250µL	F	22	2"	3	250F-LC	006300	ea.	24864	
500µL	F	22	2"	3	500F-LC	007300	ea.	24865	

## Priming Syringes for Waters 6000, 6000A, 501, 510, 590, 610 and 610E HPLC Pumps

- Designed for maximum safety with metal flange and luer-lock (LL) hub.
- Teflon®-tipped plunger.

### Hamilton



21265

Volume	Needle Term.	Hamilton		Pressure Tested to	qty.	Restek cat.#	price
		Model	cat.#				
10mL	TLL	1010W	81610	700 psig	ea.	21265	

### SGE



24759

Volume	Needle Term.	SGE		Pressure Tested to	qty.	Restek cat.#	price
		Model	cat.#				
10mL	LL	10MDR-LL-GT	008960	100 psig	ea.	24759	

\*Needles sold separately.

## Syringes for LC Autosamplers

SGE  
for Agilent 1090 & 1100 LC Autosamplers

Volume	Model	SGE cat. #	qty.	Restek cat. #	price
25µL, 1/4-32 UNEF Thread	25D-HP1090-GT	003670	ea.	22290	



22290

SGE  
for Hitachi LC Autosamplers

Volume	Model	SGE cat. #	qty.	Restek cat. #	price
500µL, M10 X1 Thread	500C-HITACH1	007660	ea.	22292	



22292

SGE  
for PerkinElmer LC Autosamplers

Volume	Model	SGE cat. #	qty.	Restek cat. #	price
100µL, 1/4-28 UNF Thread	100D-CX-GT	005990	ea.	22296	
250µL, 1/4-28 UNF Thread	250D-CX-GT	006995	ea.	22297	
500µL, 1/4-28 UNF Thread	500D-CX-GT	007995	ea.	22298	
1mL, 1/4-28 UNF Thread	1MD-C-GT	008185	ea.	22299	



22297

## Syringes for Waters WISP LC Autosamplers

Teflon® PTFE-tipped plungers

## Hamilton

Volume	Model	Hamilton cat. #	qty.	Restek cat. #	price
25µL, 1/4-28 UNF Thread	1702	80020	ea.	24528	
250µL, 1/4-28 UNF Thread	1725	80024	ea.	24529	



24528

## SGE

Volume	Model	SGE cat. #	qty.	Restek cat. #	price
25µL, 1/4-28 UNF Thread	25D-WISP	003990	ea.	22293	
250µL, 1/4-28 UNF Thread	250D-WISP	006690	ea.	22294	



22294

## Syringes for CTC LC Autosamplers

## Hamilton

Volume	Needle Term.	Needle Gauge	Needle Length	Point Style	Hamilton Model	Hamilton cat. #	qty.	Restek cat. #	price
10µL	N	22s	2"/51mm	3	701N	203073	ea.	22743	
25µL	N	22s	2"/51mm	3	1702N	203075	ea.	22744	
100µL	N	22s	2"/51mm	3	1710N Slim Line*	203077	ea.	22745	
100µL	N	22	2"/51mm	3	1710N	203235	ea.	22746	
250µL	N	22	2"/51mm	3	1725N	203079	ea.	22747	
500µL	N	22	2"/51mm	3	1750N	203349	ea.	22748	

\*Barrel OD = 6.7mm; all other 25µL and 100µL syringes have a 7.9mm barrel OD.



22746

## SGE

Volume	Needle Term.	Needle Gauge	Needle Length	Point Style	SGE Model	SGE cat. #	qty.	Restek cat. #	price
10µL	F	22s	2"/51mm	LC	10F-CTC-LC	002710	ea.	22737	
100µL*	R	22s	2"/51mm	LC	100R-C/T-GT-LC	005330	ea.	22741	
500µL*	F	22s	2"/51mm	LC	500F-CTC-GT-LC(0.41)	007720	ea.	22742	

\*Gas-tight syringe.



22737

### Restek Super-Clean Gas Trapping System for LC/MS

- 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.

The Super-Clean Gas Trapping System is the latest technology in cartridge-style gas filtration for purifying nitrogen, and is ideal for use in LC/MS systems. The two-position base plate (installed in the gas line) allows cartridges to be exchanged without introducing impurities into the system. Spring-loaded check valves seal when a cartridge is removed and open only when a new cartridge has been locked in place. There is no need for loosening and tightening fittings every time you change cartridges, and your system cannot become contaminated during the changing process.

To meet the high flow needs of the LC/MS system, the activated charcoal-filled cartridges are positioned and connected in parallel. The incoming gas stream is split equally between the cartridges, and the two streams are rejoined after purification but before the gas exits the base plate. This approach allows longer contact between the nitrogen and the adsorbent, ensuring higher gas purity and eliminating a potential source of contaminants to your analyses.

A handy date wheel, included with the system, indicates the cartridge installation date and the recommended replacement date.

Description	qty.	cat.#	price
Super-Clean Gas-Trapping System (2-position base plate, 2 charcoal filters)	ea.	22062	
Replacement Hydrocarbon (Charcoal) Filters	2-pk.	22061	

### it's a fact

A Super-Clean quick-change cartridge system efficiently removes hydrocarbons from nitrogen!

### also available

#### Looking for a nitrogen generator for your LC/MS?

Restek offers a full line of Parker® LC/MS generators. See page 307.



### Lab Organizers\*



LCLocker HPLC Organizer



Deluxe BenchBooster Organizer



Mini pHPerch Storage Unit



HPLC 30-Column Storage Cabinet



Book Holders



Open Supply Bins, 13-bin unit



TopLoader BalanceBank Storage Unit



Glove Box Dispensers

Description	dimensions	qty.	cat.#	price
LCLocker	24 x 12 x 6"	ea.	25149	
BenchBooster	24 x 7 x 12"	ea.	25150	
Mini pHPerch	13 x 12 x 6"	ea.	25147	
TopLoader	12 x 12 x 7"	ea.	25148	
30 Column Cabinet	17 7/8 x 15 x 2 7/8"	ea.	25159	
Book Holder, 0.75" ID (Small)	4 1/2 x 6 x 1 1/4"	ea.	25151	
Book Holder, 1.5" ID (Large)	4 1/2 x 6 x 1 3/4"	ea.	25152	
Open Supply Bin	24 x 12 x 10" (4-bin Unit)	ea.	25153	
Open Supply Bin	12 x 16 x 10.5" (5-bin Unit)	ea.	25154	
Open Supply Bin	12 x 7.5 x 12" (13-bin Unit)	ea.	25155	
Glove Box Dispenser	5 1/8 x 11 x 4 1/4" (Single)	ea.	25156	
Glove Box Dispenser	10 1/8 x 11 x 4 1/4" (Double)	ea.	25157	
Glove Box Dispenser	15 1/8 x 11 x 4 1/4" (Triple)	ea.	25158	

\*Please note: Accessories and supplies in photographs are not included.

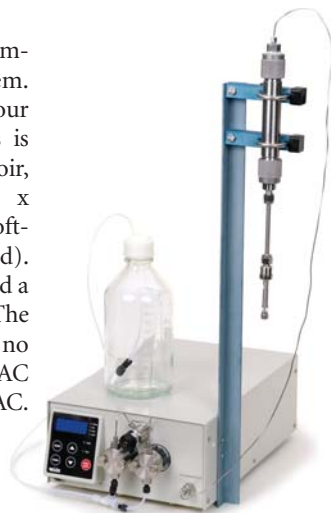


### Bulk packing materials

See page 194.

**Restek Pack in a Box Kit**

Restek's Pack in a Box Kit is a complete column-packing system. Everything you need to pack your own analytical HPLC columns is included: pump, 20 mL reservoir, column hardware (two, 150 x 4.6 mm), and system control software (computer not included). Detailed packing instructions and a DVD video also are included. The packing pump is electric, so no pressurized air is required. AC input requirement: 85-265 VAC. 10,000 psi maximum pressure.



Description	qty.	cat.#	price
Pack in a Box Kit	kit	26408	

**Bio-Safe Column System (PEEK™)**

- Completely biocompatible.
- 100% metal free.
- Stable to 8,000 psi.



Bio-Safe columns are biocompatible and precision-machined from virgin PEEK™ (polyetheretherketone), a strong, inert polymer material.

**Product Specs**

- 4.6mm ID x 30mm length column with end fittings.
- 2.0µm frits.

Description	qty.	cat.#	price
Bio-Safe Column System, PEEK, 4.6mm x 30mm, 2.0µm	ea.	26546	\$129

**HPLC Column Tubing**

Restek tubing is manufactured from fine, chromatographic-grade 316 stainless steel. It is corrosion resistant, ultrasonically cleaned and passivated. We polish the tubing and promise a burr-free cut. You can use this tubing immediately—there is no need for additional treatment.

Length	2.1mm ID		3.2mm ID		4.6mm ID	
	cat.#	price	cat.#	price	cat.#	price
1/4" OD Tubing						
30mm	25100		25106		25112	
50mm	25101		25107		25113	
100mm	25102		25108		25114	
150mm	25103		25109		25115	
200mm	25104		25110		25116	
250mm	25105		25111		25117	

**Empty Chromatography Columns**

- 316 stainless steel tubing complete with end-fittings, frits, nuts, and ferrules.
- Preassembled prior to shipment, unless otherwise requested.
- Internal 1/16-inch seats are compatible with Valco® and Parker fittings.

Length	2.1mm ID		3.2mm ID		4.6mm ID	
	cat.#	price	cat.#	price	cat.#	price
1/4" OD Tubing						
30mm	25118	\$73	25124	\$73	25130	
50mm	25119	\$73	25125	\$73	25131	
100mm	25120	\$73	25126	\$73	25132	
150mm	25121	\$80	25127	\$81	25133	
200mm	25122	\$80	25128	\$80	25134	
250mm	25123	\$80	25129	\$80	25135	

**Column End-Fittings**

1/4-inch end-fittings are compatible with Valco® and Parker fittings.

Description	qty.	cat.#	price
Column End-Fitting for 4.6mm Column	ea.	25077	
Column End-Fitting Flat Bottom	ea.	25078	



Packing particle size	Use this pore size:
3–4µm	0.5µm
5–20µm	2.0µm

**1/4-Inch HPLC Frits**

We manufacture our frits from fine, chromatographic-grade 316 stainless steel, and we offer sizes to fit most column and pore sizes. To choose the correct frit, check its pore size compatibility with the particle size of the packing in the column (see chart above). If the packing has a smaller particle size than the pore size of the frit, the packing can clog the frit.

ID	Pore Size	qty.	cat.#	price
4.6mm	2.0µm	10-pk.	25071	
4.6mm	0.5µm	10-pk.	25072	
3.2mm	2.0µm	10-pk.	25073	
3.2mm	0.5µm	10-pk.	25074	
2.1mm	2.0µm	10-pk.	25075	
2.1mm	0.5µm	10-pk.	25076	