

GC Accessories

Restek Catalog 2009/10 p134-249



GC Accessories

Instrument Supplies

Leak Detectors	137
Septa	138
Maintenance Kits	139
Inlet Liner Anatomy	140-142
Liner Deactivations	143
Inlet Liner Packing Materials & Accessories	144-145
Supplies for Agilent GCs	146-172
Supplies For Varian GCs	173-177
Supplies For Shimadzu GCs	178-181
Supplies For PerkinElmer GCs	182-185
Supplies For Thermo Scientific GCs	186-191
Supplies for ATAS Injectors	192
Supplies For APEX Injectors	192
Packed Column Inlet Conversion	193-195
Dual-Column Analysis	196-198
ELCD/PFPD Supplies	199
Purge & Trap Supplies	199
PID Lamps	199

Column Installation

Leak Detector & Flow Meters	201-202
Column Installation Tools & Tool Kits	202-209
Ferrules	210-212
Connectors	213-219

Gas Purification Essentials

Gas Purification Solutions	221
Gas Purification	222-229
Gas Generators	230-233
Gas Regulators & Accessories	234-236
Tube & Pipe Fittings	237-241
Tubing & Valves	242-246
Leak Detector	246
Installation Tools	247
Tubing & Fitting Tools	248-249

GC ACCESSORIES INSTRUMENT SUPPLIES

Leak Detectors	137
Septa	138
Maintenance Kits	139
Inlet Liner Anatomy	140-142
Liner Deactivations	143
Inlet Liner Packing Materials & Accessories	144-145
Supplies for Agilent GCs	146-172
Supplies For Varian GCs	173-177
Supplies For Shimadzu GCs	178-181
Supplies For PerkinElmer GCs	182-185
Supplies For Thermo Scientific GCs	186-191
Supplies for ATAS Injectors	192
Supplies For APEX Injectors	192
Packed Column Inlet Conversion	193-195
Dual-Column Analysis	196-198
ELCD/PFPD Supplies	199
Purge & Trap Supplies	199
PID Lamps	199



Top: Greg Dawson, Regulatory Technician
Bottom: Kim Dawson, Manufacturing Technician



Restek Electronic Leak Detector

Why have a small leak turn into a costly repair? Protect your data 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, 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	1.0×10^{-5}	Red
Hydrogen*	1.0×10^{-5}	Red
Nitrogen	1.4×10^{-3}	Yellow
Argon	1.0×10^{-4}	Yellow
Carbon Dioxide	1.0×10^{-4}	Yellow

Description	qty.	cat.#	price
Leak Detector with Universal Charger Set (US, UK, European, Australian)	ea.	22839	
Soft-Side Carry/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.



Checking for leaks maintains the integrity of a GC system.



22839



22839

Carrying/storage 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.



22658



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

HANDY septum size chart

Instrument	Septum Diameter (mm)
Agilent (HP)	
5880A, 5890, 6850, 6890, 7890, PTV	11
5700, 5880	9.5/10
On-Column Injection	5
Thermo Scientific	
TRACE GC	17
GCQ w/TRACE, PTV	17
8000 series	17
Finnigan (TMQ)	
GC 9001	9.5
GCQ	9.5
QCQ	9.5
TRACE 2000	9.5
Gow-Mac	
6890 series	11
All other models	9.5
PerkinElmer	
Sigma series	11
900,990	11
8000 series	11
Auto SYS	11
Auto SYS XL	11
Pye/Unicam	
All models	7
Shimadzu	
All models	Plug
SRI	
All models	Plug
Tracor	
540	11.5
550,560	9.5
220,222	12.5
Varian	
Injector type:	
Packed column	9.5/10
Split/splitless	
1078/1079	10/11
1177	9
1075/1077	11

tech tip

Tips for Handling Septa

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

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 (1/16")	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
12.5mm (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
12.5mm (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
12.5mm (1/2") CenterGuide	27114	27115
17mm CenterGuide	27116	27117
Shimadzu Plug	27118	27119

Make Life Easier (MLE) Capillary Tool Kits, Inlet and FID Maintenance Kits

- 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.



22186

All MLE Capillary Tool Kits include these components:

- $\frac{1}{8}$ ", $\frac{3}{16}$ ", and $\frac{1}{4}$ " nylon brushes
- $\frac{1}{4}$ ", $\frac{3}{8}$ ", and $\frac{3}{16}$ " stainless steel wire tube brushes
- stainless steel surface brush
- 6 stainless steel jet reamers (0.25–0.65mm 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
- 15cm 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
- 6mm x 7mm open end wrench
- 8mm x 10mm open end wrench
- 16mm x 17mm 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
- 6mm x 7mm open end wrench
- 8mm x 10mm open end wrench
- 16mm x 17mm 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



22181

Inlet kit (cat.# 22181) includes:

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



22179

FID kits (cat.#s 22180, 22179) include:

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

Description

Inlet Maintenance Kit for Agilent 5890/6850/6890/7890 GCs

FID Maintenance Kit for Agilent 5890 GCs

FID Maintenance Kit for Agilent 6850/6890/7890 GCs

MLE Capillary Tool Kit for Agilent GCs

MLE Capillary Tool Kit for PerkinElmer GCs

MLE Capillary Tool Kit for Shimadzu GCs

MLE Capillary Tool Kit for Thermo Scientific GCs

MLE Capillary Tool Kit for Varian GCs

qty.

kit

kit

kit

kit

kit

kit

kit

kit

cat.#

22181

22180

22179

22186

22185

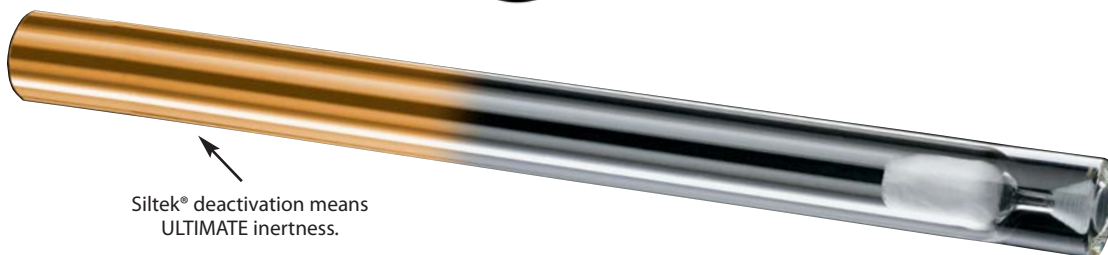
22182

22183

22184

price

Liner Anatomy



Let's Begin

To correctly diagnose which inlet liner is right for your application, let's first consider the method of sample introduction.

Split Injections

Split injections are a fast, efficient way to transfer a portion of the sample onto the column for analysis. Split injection is often used for dirty samples or highly concentrated samples.

Splitless Injections

Splitless injection involves an initial hold time where the split vent flow is turned off and the incoming sample flow is forced onto the column. It is an excellent technique for low concentration samples and commonly is used in drug screening and pesticide residue methods.

Direct Injections

Direct injection is an alternative to splitless injection. It is an excellent technique for trace samples, especially those that are prone to degradation inside the injection port.

Programmable Temperature Vaporization (PTV)

PTV injection techniques offer a means to inject a sample into a cold injection port that can be rapidly heated to transfer analytes into the GC. These techniques can reduce sample degradation, increase reproducibility, and allow for larger volumes of sample to be introduced, ultimately increasing sensitivity.

Gaseous Sample Introduction

Purge and trap and headspace techniques that sweep a gaseous sample through the injection port onto the column require fast flow through the liner and very small liner volumes to minimize band broadening effects. Split flow operation is typically used to achieve this effect.



Deactivation

Liners and their packing materials need to provide highly inert pathways to guard against sample adsorption (reversible or irreversible) and sample degradation. There are three prominent deactivation options.

Siltek® Deactivation

Siltek® deactivated liners offer the most chemically inert sample pathway—perfect for low-level analyses or highly active compounds, where preventing sample loss and degradation is critical.

Intermediate Polarity (IP) Deactivation

IP deactivation offers good recovery and reproducibility for both polar and nonpolar compounds—making IP an excellent general-purpose deactivation.

Base Deactivation (BD)

Base deactivation (BD) is ideal for the analysis of basic compounds, such as amines and basic drugs. It prevents analyte adsorption which manifests as either irreproducible results or peak tailing. Couple BD liners with BD columns for best results.

restek **exclusive!**

Siltek® treated metal inlet liners



Packing Options

Proper selection of liner packing material and position improves sample vaporization, prevents nonvolatile compounds from entering the column, and permits large volume injections in programmable temperature vaporization applications. Sample characteristics and injection technique will dictate packing use. Analyses of high molecular weight analytes, especially in split mode, benefit from the use of packing.

Packing Material

Glass wool is the most common packing material. Properly deactivated glass wool provides an inert means of effectively vaporizing a sample, improving reproducibility and decreasing high molecular weight discrimination. An alternative to glass wool is Carbofrit packing (highly dense and inert).

Packing Position

- Packing placed near the bottom of the liner prevents nonvolatile compounds and septum particles from entering the column. Liners designed for splitless applications often have packing near the bottom, since the long analyte residence time in the liner is usually adequate to vaporize the sample.
- Packing near the middle of the liner enhances vaporization and can improve reproducibility. Precision™ liners are designed with built-in stops, keeping the wool properly positioned when wiping the needle. This ensures precise sample delivery each time. Good needle maintenance is critical as a burred needle can pull the packing out of position, eliminating its effectiveness.



Precision™ liners keep wool in position injection after injection.

Packing in PTV Injections

Packing material used in liners for PTV injection can serve as vaporization aides and a means of trapping nonvolatile compounds. Additionally, the packing can act as a reservoir for large volume injections, making it possible to inject greater than 100µL of sample.

Volume and Inner Diameter

Sample expansion volume and linear velocity should be 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.

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 ₂ O	C ₆ S	CH ₂ Cl ₂	Hexane	Isooctane
0.5	710	212	200	98	78
1.0	1420	423	401	195	155
2.0	2840	846	802	390	310
5.0	7100	2120	2000	975	775

— indicates expansion volume exceeds effective liner volume.

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 0.18mm, 0.15mm, and 0.10mm ID columns are used.

Inlet Liner Anatomy



Geometry

Many inlet liners are designed with special geometries. Generally liner geometries are intended to aid sample vaporization and protect the sample, especially during splitless injections. Additionally for PTV applications, liners provide wettable surface area for large volume injections.

Enhance Vaporization

To avoid molecular weight (MW) discrimination (a phenomenon where high MW compounds are not vaporized efficiently and are therefore under-represented in the analyzed sample), some liners are designed with complex flow paths to aid vaporization.

Cyclosplitter®*Laminar Cup***Protect the sample**

Some samples are prone to degradation inside of the injector, especially when in contact with hot metal surfaces. Several liners are designed specifically to minimize contact with the injection port.

Gooseneck*Double Gooseneck**Cyclo Double Gooseneck*

Some liners combine both features! →

Baffles in PTV Liners

The baffles in PTV liners can act as a means to help vaporize a sample during a hot split or splitless injection, but typically they act as “wells” where liquid sample can be retained during cold injections. In this way, the baffle liners allow for larger volume injections to be made, typically on the order of 10µL.

Direct Injections with Uniliner® and Drilled Uniliner® Inlet Liners

Uniliner® and Drilled Uniliner® inlet liners allow 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 and is a good choice for trace analyses. It also minimizes sample exposure to hot injection port parts, potentially improving sample stability and reproducibility.

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.

*Drilled Uniliner® with hole near bottom**Drilled Uniliner® with hole near top*

Instruments equipped with electronic pressure control must use Drilled Uniliner® inlet liners.



Liner Maintenance

Inlet liners are key to injection port maintenance and need to be changed regularly to avoid the following problems:

- 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.

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.

Liner Deactivations Available from Restek**Intermediate Polarity (IP) Deactivation**

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

**Base Deactivation**

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

All liners are
100%
deactivated

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

Siltek® Deactivation

- Revolutionary, proprietary deactivation for difficult matrices and reactive compounds.
- Inertness retained over a wide sample range.
- Minimal bleed.
- Ideal for chlorinated pesticide analysis.
- Recommended for use with Rtx®-CLPesticides, Stx™-CLPesticides, and Rtx®-TNT columns.

Siltek® Deactivation for Liners

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

Our 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 enquire addl. cost	-213.1 enquire addl. cost	-216.1 enquire addl. cost
5-pk.	-214.5 enquire addl. cost	-213.5 enquire addl. cost	-216.5 enquire addl. cost
25-pk.	-214.25 enquire addl. cost	-213.25 enquire addl. cost	-216.25 enquire addl. cost



Siltek® Coated Liners

Base-Deactivated Inlet Liners

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 enquire addl. cost	-211.1 enquire addl. cost	-229.1 enquire addl. cost
5-pk.	-210.5 enquire addl. cost	-211.5 enquire addl. cost	-229.5 enquire addl. cost
25-pk.	-210.25 enquire addl. cost	-211.25 enquire addl. cost	-229.25 enquire addl. cost

Ideal for amines and basic compounds!



tech tip

Minimizing Backflash

Backflash occurs when the volume of the sample vapor exceeds the effective volume of the injection liner. This phenomenon causes poor reproducibility, tailing analyte peaks, a broad solvent peak, ghost peaks, and nonlinear responses. You can minimize backflash by using a solvent that has a low expansion volume, injecting less sample, installing an injector liner with a larger volume, or reducing the injector temperature.

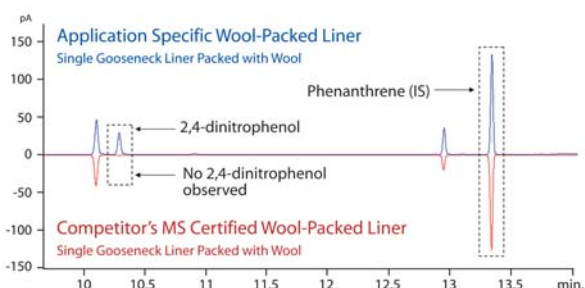
Liner Packing Materials

Application Specific Deactivated Wool

New deactivated wool gives excellent inertness for semivolatile analysis. The acidic compounds are reactive and can be difficult to quantify with wool placed in the inlet liner. With the new deactivation used for wool, the response of 2,4-dinitrophenol is excellent and an improvement over other competitor deactivated wool for semivolatile analysis. As shown in Figure 1, the response of 10ng of 2,4-dinitrophenol using the new wool in the liner is 0.21, where the competitive "MS Certified Liner with Wool" liner shows virtually no response.



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



To order the new Application Specific Wool in prepacked liners, add the corresponding suffix number to the liner catalog number.

qty.	IP Deactivated Liner with Application Specific Wool	Siltek Liner with Application Specific Wool
each	-231.1 enquire addl. cost	-232.1 enquire addl. cost
5-pk.	-231.5 enquire addl. cost	-232.5 enquire addl. cost
25-pk.	-231.25 enquire addl. cost	-232.25 enquire addl. cost

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	

Base-Deactivated Wool

Ideal for amines and other basic compounds.



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



please note

Liner packing materials and their uses in various liners are described on **page 141**.

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	enquire addl. cost
5-pk.	-200.5	-209.5	enquire addl. cost
25-pk.	-200.25	-209.25	enquire 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 >3.5mm when using puller-insert tool listed below.*



Add the corresponding suffix number to the liner catalog number.

Description	suffix	price
each	-209.1	enquire addl. cost
5-pk.	-209.5	enquire addl. cost
25-pk.	-209.25	enquire 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/Inserter Tool

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

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



Use of Packings with Autosampler

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

**Mini Wool Puller/Inserter**

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



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



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	



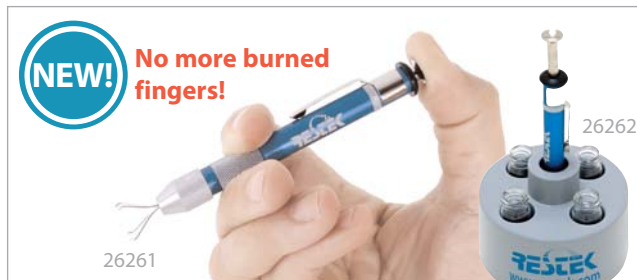
No more burned fingers!

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	

**The Claw and The Claw Holder Kit**

- Easily removes hot liners from injection ports.
- 4mL vials (not included) can be changed out and disposed of 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 4mL 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	
4.0mL Clear Vial, White Graduated Marking Spot	100-pk.	24658	

**Injector Maintenance**

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

Splitless Liners for Agilent GCs	Benefits/Uses	ID* OD x Length	Similar to Agilent part #	ea.	cat. # price 5-pk.	25-pk.
 2mm Splitless	trace samples <2 μ L	2.0mm 6.5mm x 78.5mm	5181-8818 (ea.) 5183-4703 (5-pk.) 5183-4704 (25-pk.)	20712	20713	20714
 4mm Splitless	trace samples >2 μ L	4.0mm 6.5mm x 78.5mm	210-3003 (ea.) 210-3003-5 (5-pk.)	20772	20773	20774
 4mm Splitless w/Wool	trace samples >2 μ L	4.0mm 6.5mm x 78.5mm	19251-60540 (ea.) 5183-4691 (5-pk.) 5183-4692 (25-pk.)	22400	22401	22402
 2mm Splitless (quartz)	trace samples <2 μ L	2.0mm 6.5mm x 78.5mm	18740-80220 (ea.) 5183-4707 (5-pk.)	20914	20915	—
 4mm Splitless (quartz)	trace samples >2 μ L	4.0mm 6.5mm x 78.5mm	—	20912	20913	—
 4mm Splitless (quartz) w/Wool	trace samples >2 μ L	4.0mm 6.5mm x 78.5mm	—	22403	22404	—
 Gooseneck Splitless (2mm)	trace samples <2 μ L	2.0mm 6.5mm x 78.5mm	—	20795	20796	20797
 Gooseneck Splitless (4mm)†	trace samples >2 μ L	4.0mm 6.5mm x 78.5mm	5181-3316 (ea.) 5183-4695 (5-pk.) 5183-4696 (25-pk.)	20798	20799	20800
 Gooseneck Splitless (4mm) w/Wool†	trace samples >2 μ L	4.0mm 6.5mm x 78.5mm	5062-3587 (ea.) 5183-4693 (5-pk.) 5183-4694 (25-pk.)	22405	22406	22407
 Double Gooseneck Splitless (4mm)	trace, active samples >2 μ L	4.0mm 6.5mm x 78.5mm	5181-3315 (ea.) 5183-4705 (5-pk.) 5183-4706 (25-pk.)	20784	20785	20786
 Cyclo Double Gooseneck (2mm)	trace, active, dirty samples <2 μ L	2.0mm 6.5mm x 78.5mm	—	20907	20908	—
 Cyclo Double Gooseneck (4mm)	trace, active, dirty samples >2 μ L	4.0mm 6.5mm x 78.5mm	—	20895	20896	20997
 Recessed Gooseneck (2mm)**	base easily packs with wool for dirty samples <2 μ L	2.0mm 6.5mm x 78.5mm	—	20980	20981	20982
 Recessed Gooseneck (4mm)**	base easily packs with wool for dirty samples >2 μ L	4.0mm 6.5mm x 78.5mm	—	20983	20984	20985
 Recessed Gooseneck (4mm) w/Wool**	base easily packs with wool for dirty samples >2 μ L	4.0mm 6.5mm x 78.5mm	—	22408	22409	22410
 Recessed Double Gooseneck (4mm)**	trace, active samples >2 μ L	4.0mm 6.5mm x 78.5mm	—	20986	20987	20988

*Nominal ID at syringe needle expulsion point.

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

†Use this liner for increased sensitivity.

All liners are
100%
deactivated

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



















Restek can provide any of the liners shown deactivated according to any of our three proprietary processes, including our highly inert Siltek® coating. The processes are described on **page 140** and ordering information is on **page 143**.









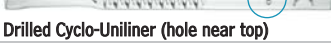



Packing materials, including wool and CarboFrits™, can be provided in any liner—subject to the liner ID and geometry. Packing materials are described on **page 141** and ordering information is on **pages 143-144**.



Siltek® Treated Liners

Split Liners for Agilent GCs	Benefits/Uses	ID* OD x Length	Similar to Agilent part#	ea.	cat.# / price 5-pk.	25-pk.
 1mm Split**	for purge & trap inlet splitting or sample <1µL	1.0mm 6.3mm x 78.5mm	18740-80200 (ea.) 5183-4709 (5-pk.)	20972	20973	—
 4mm Split w/Wool	universal, use with Agilent 7673 autosampler	4.0mm 6.3mm x 78.5mm	19251-60540 (ea.) 5183-4691 (5-pk.) 5183-4692 (25-pk.)	20781	20782	20783
 Laminar Cup Splitter	high MW compounds	4.0mm 6.3mm x 78.5mm	—	20801	20802	—
 mini-Lam Split	high MW compounds	4.0mm 6.3mm x 78.5mm	—	20990	20991	—
 Cup Splitter	high & low MW compounds	4.0mm 6.3mm x 78.5mm	18740-80190 (ea.) 5183-4699 (5-pk.)	20709	20710	—
 Cyclosplitter	dirty samples, many injections before cleaning required	4.0mm 6.3mm x 78.5mm	—	20706	20707	20708
 2mm Split Precision Liner w/Wool	dirty samples, trace samples	2.0mm 6.3mm x 78.5mm	—	20823	20824	—
 4mm Split Precision Liner w/Wool	dirty samples, trace samples	4.0mm 6.3mm x 78.5mm	210-4004-5 (5-pk.)	21022	21023	20979
 4mm Gooseneck Precision Liner	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.
 Low Pressure Drop Liner w/Wool	universal	4.0mm 6.3mm x 78.5mm	—	21032	21033	—
 Low Pressure Drop Liner w/Wool	universal	4.0mm 6.3mm x 78.5mm	5183-4647 (ea.) 5183-4701 (5-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.
 PTV On-Column Liner	allows on-column injection with a 0.53mm ID column	1.7mm 3.0mm x 71mm	—	24976	24977	—
 Straight Glass	general use	2.0mm 3.0mm x 71mm	5183-2036	—	—	21157
 Baffled Glass	active compounds, drugs, pesticides	1.5mm 3.0mm x 71mm	5183-2037	—	—	21704
 Glass w/Wool	large volume injections	2.0mm 3.0mm x 71mm	5183-2038	—	—	21156
SPME Liners for Agilent GCs	Benefits/Uses	ID* OD x Length		cat.# / price ea.	cat.# / price 5-pk.	
 SPME Liner	ideal for low-volume SPME applications	0.75mm 6.35mm x 78.5mm		21110	21111	

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

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		20335	20336	
 Cyclo-Uniliner	trace, dirty, high MW active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm		20337	20338	
 Open-top Uniliner w/Wool	trace, dirty, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm		20843	20844	

*Nominal ID at syringe needle expulsion point.

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

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.



Restek can provide any of the liners shown deactivated according to any of our three proprietary processes, including our highly inert Siltek® coating. The processes are described on **page 140** and ordering information is on **page 143**.



Packing materials, including wool and CarboFrits™, can be provided in any liner—subject to the liner ID and geometry. Packing materials are described on **page 141** and ordering information is on **pages 143-144**.



Siltek® Treated Liners



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



Description	Max. temp.	Similar to Agilent part #	qty.	cat.#	price
Viton O-Rings for Agilent GCs	250°C	5180-4182	25-pk.	20377	

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.#	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
Replacement Viton 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



Thermolite® Septa



BTO® Septa

Septa for Agilent GCs

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

Now precision molded!

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

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

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



Nut

Septa

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.

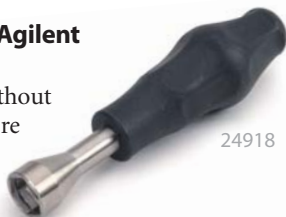


21309

Description	Similar to Agilent part #	qty.	cat.#	price
Autosampler & PTV Septum Nut (for 23-gauge needles)	18740-60835	ea.	20631	
Manual Injection Septum Nut (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 1/8" 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).



Capillary Column Nuts for Agilent 5890/6890/7890 GCs

Available in brass or stainless steel.



for use with "compact"
Agilent-style ferrules



for use with standard ferrules

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

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



21882

Capillary Column Nuts for Agilent 6850 GCs

- Meet or exceed original manufacturer's performance.
- High-quality stainless steel.

Description	Similar to Agilent part #	qty.	cat.#	price
Capillary Column Nuts for Agilent 6850 GCs	5183-4732	2-pk.	21882	



22347

Hot Swap Capillary Column Nuts

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

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

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

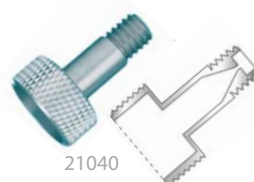


21312

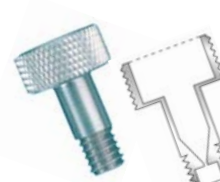
Finger-Tight Capillary Column Nuts

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

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



21040



21041

Finger-Tight Capillary Column Nuts

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

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



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.

restek **innovation!**



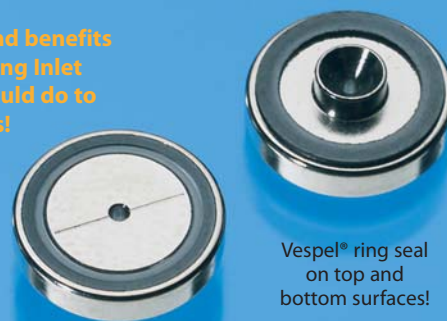
Patented.



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



Take a look at the features and benefits of the Restek Dual VespeL® Ring Inlet Seals and evaluate what it could do to extend your column lifetimes!



VespeL® ring seal on top and bottom surfaces!

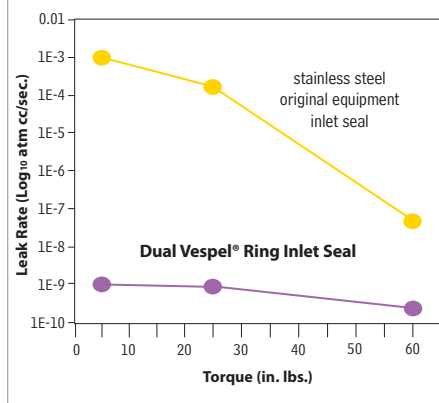
Unique Features

	Restek Dual VespeL Ring Inlet Seal	Replacement Inlet Seals with Washers
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.	✓	NA

Dual VespeL® Ring Inlet Seals for Agilent GCs

Our patented Dual VespeL® Ring Inlet Seal greatly improves injection port performance—it stays sealed, even after repeated temperature cycles, without retightening the reducing nut! This seal features two soft VespeL® rings, one embedded in its top surface and the other embedded in its bottom surface. These rings eliminate the need for a washer, and ensure very little torque is needed to make a leak-tight seal. The rings will not harm the critical seal in the injector body, or any other surface, and are outside the sample flow path. Tests using a high sensitivity helium leak detector show Dual VespeL® Ring Inlet Seals will seal equally effectively at torques from 5 in. lb. to 60 in. lb. (Figure 1).

Figure 1 The Dual VespeL® Ring Inlet Seal achieves leak-tight seals even at low torque, reducing the chance of leak-related problems.



Use a stainless steel seal for analyses of unreactive compounds. To reduce breakdown and adsorption of active compounds, use a gold-plated or Siltek®-treated seal.

0.8mm ID Dual VespeL Ring Inlet Seal	2-pk./price	10-pk./price
Gold-Plated	21240	21241
Siltek Treated	21242	21243
Stainless Steel	21238	21239
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

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
Stainless Steel	22087	22088

Replacement Inlet Seals with Washers

- Special grade of stainless steel that is softer, creating a better seal.
- Siltek® treatment provides inertness similar to fused silica.
- All seals include washers.

Replacement Inlet Seals for Agilent GCs

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

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

Single-Column Installation (0.8mm Opening)	Similar to Agilent part #	2-pk./price	10-pk./price
Replacement Inlet Seal			
Gold-Plated	18740-20885	21317	21318
Siltek Treated		21319	21320
Stainless Steel	18740-20880	21315	21316
0.25/0.32mm ID Dual-Column Installation (1.2mm Opening) Replacement Inlet Seal		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 Opening) Replacement Inlet Seal		2-pk./price	10-pk./price
Stainless Steel		20392	20393

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	21010
Siltek Treated	—	21011	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	



Note: The 1.2mm inlet seal is recommended when installing two columns using a two-hole Vespel®/graphite ferrule.

All seals include washers.

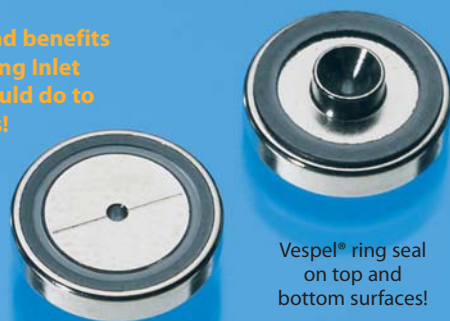


restek **innovation!**



Patented.

Take a look at the features and benefits of the Restek Dual VespeL® Ring Inlet Seals and evaluate what it could do to extend your column lifetimes!



VespeL® ring seal on top and bottom surfaces!

This page intentionally left blank.

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. ✓

Restek Dual VespeL Ring Inlet Seal

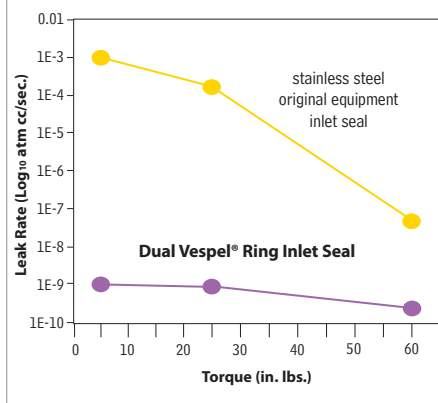
Replacement Inlet Seals with Washers

NA

Dual VespeL® Ring Inlet Seals for Agilent GCs

Our patented Dual VespeL® Ring Inlet Seal greatly improves injection port performance—it stays sealed, even after repeated temperature cycles, without retightening the reducing nut! This seal features two soft VespeL® rings, one embedded in its top surface and the other embedded in its bottom surface. These rings eliminate the need for a washer, and ensure very little torque is needed to make a leak-tight seal. The rings will not harm the critical seal in the injector body, or any other surface, and are outside the sample flow path. Tests using a high sensitivity helium leak detector show Dual VespeL® Ring Inlet Seals will seal equally effectively at torques from 5 in. lb. to 60 in. lb. (Figure 1).

Figure 1 The Dual VespeL® Ring Inlet Seal achieves leak-tight seals even at low torque, reducing the chance of leak-related problems.



Use a stainless steel seal for analyses of unreactive compounds. To reduce breakdown and adsorption of active compounds, use a gold-plated or Siltek®-treated seal.

0.8mm ID Dual VespeL Ring Inlet Seal	2-pk./price	10-pk./price
Gold-Plated	21240	21241
Siltek Treated	21242	21243
Stainless Steel	21238	21239
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

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
Stainless Steel	22087	22088



This page intentionally left blank.

Direct Replacement and Siltek® Treated 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.



Direct Replacement and Siltek® Treated Split/Splitless Injection Port for Agilent 5890 GCs

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



Direct Replacement and Siltek® Treated Split/Splitless Injection Port for Agilent 6890/6850 GCs

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

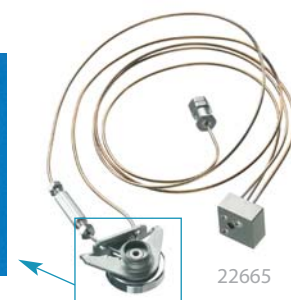
Injection Port Weldments for Agilent GCs for use with Purge and Trap Systems

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



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	



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.



27184

1/16-Inch Capillary Inlet Adaptor Fitting Kit

(Split/splitless fitting for capillary columns)

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



22078

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	



24323

EPC Test Kit for Agilent 6890 GCs

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

Description	Similar to Agilent part #	qty.	cat.#	price
EPC Test Kit for Agilent 6890 GCs	G1530-60960*	kit	24323	

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



22068

23035

22069

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	ea.	22068	
Injector/FID Heater	19231-60620	ea.	22069	
Injector/FID PRT Sensor	19231-60660	ea.	23035	



Heat Sink for Agilent 5890 GC Split/Splitless Injector

- Meets or exceeds original manufacturer's performance.

Description	Similar to Agilent part #	qty.	cat.#	price
Heat Sink for Agilent 5890 GCs	18740-20940	ea.	20409	



Catch the Buzz

Sign up for Restek's e-newsletter, *The Buzz*

www.restek.com/buzz



Heater Block Retaining Nuts for Agilent GC Split/Splitless Injectors

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

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



Oven Temperature Sensor Assembly

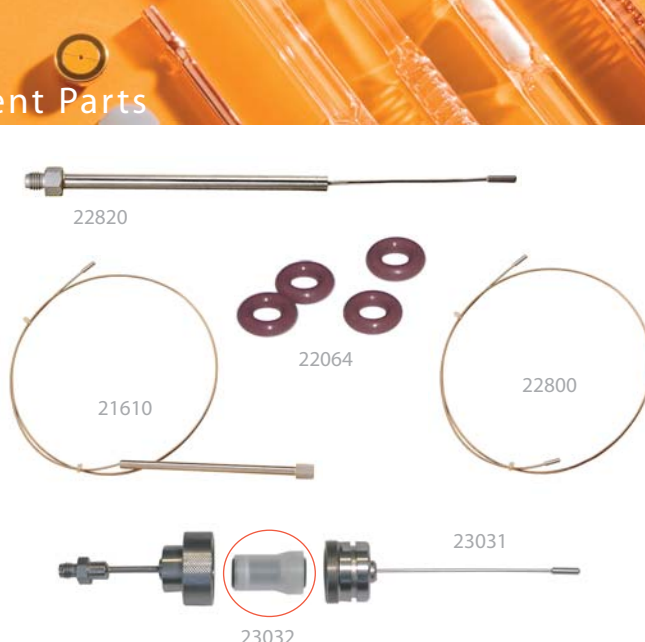
Description	Similar to Agilent part #	qty.	cat.#	price
Oven Temperature Sensor for Agilent 5890 GC	05890-61030	ea.	23040	
Oven Temperature Sensor for Agilent 6890 GC	G1530-61030	ea.	23039	



60psig Backpressure Regulator Kit

Increase the versatility of your Agilent 5890 GC by replacing the existing 30psig (207kPa) backpressure regulator and gauge with our 60psig (414kPa) regulator. Enables you to use longer 60m and 105m columns as well as shorter 10m 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 for Agilent GCs (32-inch)	19251-80525			
(Includes all installation hardware.)	G1544-20620	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 149 or visit www.restek.com and search on septa.





Oven Flapper Assemblies for Agilent 5890/6890 GCs

- Insulation is replaceable, using Restek's Oven Flapper Assemblies.
- Ensure even and consistent column heating, run after run, by replacing the oven flapper assembly 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.

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

- 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.



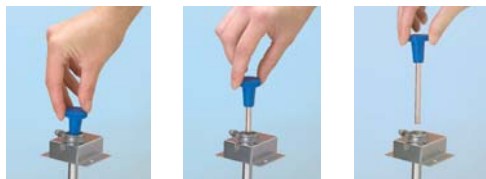
Make your injection port threads like new!

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	

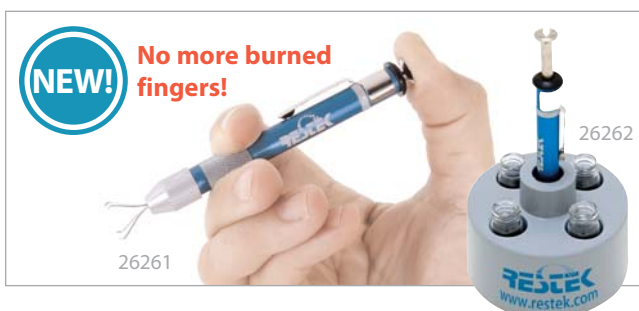
Inlet Liner Removal Tool

- 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	



The Claw and The Claw Holder Kit

- Easily removes hot liners from injection ports.
- 4mL vials (not included) can be changed out and disposed of 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 4mL 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	
4.0mL Clear Vial, White Graduated Marking Spot	100-pk.	24658	



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 (0.25–0.65mm 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
- 15cm compact steel ruler
- pocket magnifier
- high temperature string (1 meter)
- pipe cleaner (12-inch)
- cotton tip swabs (pk. of 25)

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



also **available**

Looking for autosampler vials?

Restek carries a full line of autosampler vials for Agilent autosamplers. See **pages 253 to 267** or visit www.restek.com and search on autosampler vial.

Direct Injection (DI) Inserts and Liner Adaptor for 1/4-Inch Packed Column Injection Ports (for 0.25, 0.32, & 0.53mm 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 0.53mm 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	ea.	20964	
	5080-8732	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 (page 149) separately.



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
Micropacked Column Adaptor Kit for Split/Splitless Injection* <i>Complete kit with FID and injection port adaptors</i> Kit includes: Dual Vespel Ring Inlet Seal, large bore; reducing nut, large bore; FID adaptor, large bore; 1/4" ferrule, Vespel/graphite; 1/4" nut, stainless steel; 1/16" ferrules, Vespel/graphite (2); 4mm splitless liner, intermediate polarity deactivated; 1/16" nuts, stainless steel (2)	kit	22424	
Micropacked Column Adaptor Kit for On-Column Injection* <i>Complete kit with FID and injection port adaptors</i> Kit includes: Dual Vespel Ring Inlet Seal, large bore; reducing nut, large bore; FID adaptor, large bore; 1/4" ferrule, Vespel/graphite; 1/4" nut, stainless steel; 1/16" ferrules, Vespel/graphite (2); Siltek treated metal liner installation guide; 1/16" nuts, stainless steel (2)	kit	22425	
Micropacked Column Adaptor Kit for Split/Splitless Injection Injection Port Adaptor Kit Kit includes: Dual Vespel Ring Inlet Seal, large bore; reducing nut, large bore; 1/16" ferrule, Vespel/graphite; 1/16" nut, stainless steel; 4mm splitless liner, intermediate polarity deactivated	kit	22426	
Micropacked Column Adaptor Kit for On-Column Injection Injection Port Adaptor Kit 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	
Micropacked Column Adaptor Kit for FID* <i>FID Adaptor Kit</i> Kit includes: FID adaptor, large bore; 1/4" ferrule, Vespel/graphite; 1/4" nut, stainless steel; 1/16" nut, stainless steel; 1/16" ferrule, Vespel/graphite	kit	22428	
Replacement Inlet Seals for Micropacked Column Adaptor Dual Vespel Ring Inlet Seals, large bore (2)	2-pk.	22429	
Replacement Metal Liner Installation Guide for On-Column Injection Siltek treated metal liner installation guide	ea.	22430	
Replacement 4mm Splitless Liner	ea.	20772	

*For use with packed column FIDs only.



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

also available

Looking for more information or products on converting packed columns to capillary columns? See pages 193-195.

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 0.8mm).
- 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
mini-Lam DI Tee Kit (includes all fittings and ferrules)	kit	20436	
Replacement 4mm mini-Lam DI Tee	ea.	20435	



20436



27185

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 1.2mm ID Dual Vespel® Ring Inlet Seal, and one 0.4mm ID two-hole ferrule.

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

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 0.8mm) 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	



20645

For use with
0.53mm ID columns.**1/8-Inch Capillary Inlet Adaptor Fitting Kit**

(Split/splitless fitting for 0.53mm 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 0.8mm 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 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 196-198.

EZ No-Vent™ GC Column-Mass Spectrometer Connector

- Change GC/MS columns in minutes without venting—100µm 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.
- Available for Agilent GCs with 5971/5972, 5973, or 5975 GC/MS.

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 in 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.

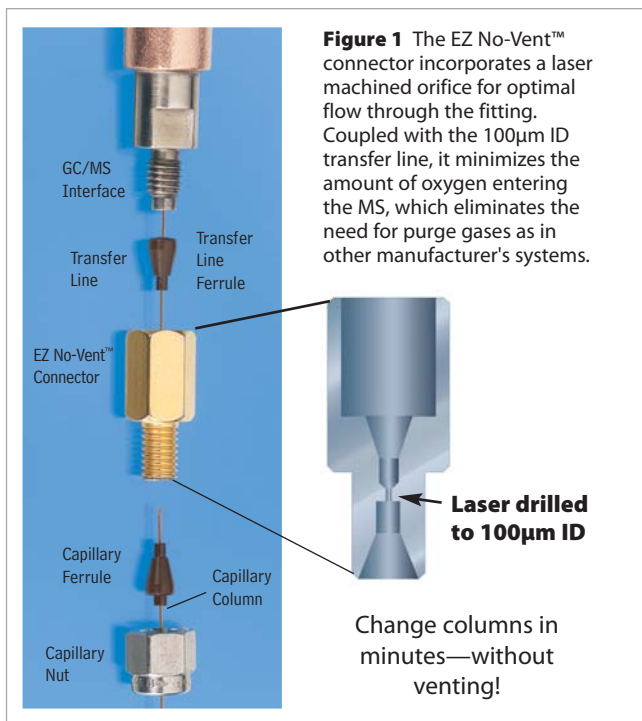
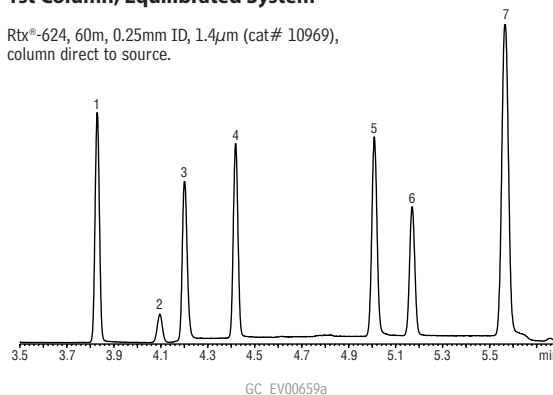


Figure 2 Sharp, symmetric peaks for gases show the EZ No-Vent™ connector does not add dead volume and allows rapid column changes.

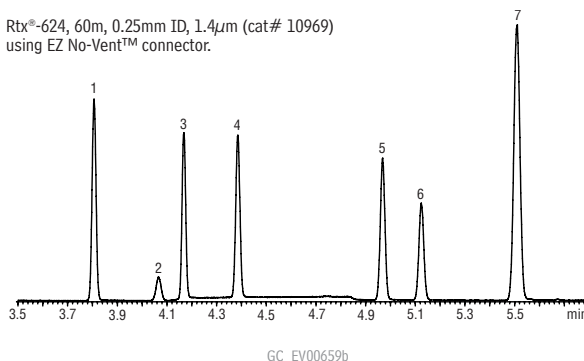
1st Column, Equilibrated System

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	Oven temp.:	60°C isothermal
Inj.:	Purge & Trap	Det:	Agilent 5973 GC/MS
GC	Agilent 6890	Transfer line temp.:	280°C
Inj. temp.:	300°C	Scan range:	35-550amu
Carrier gas:	helium, constant flow	Tune	BFB
Flow rate:	1.0mL/min.	Ionization:	EI

restek
innovation!

Kit installs easily,
without special
tools or plumbing.



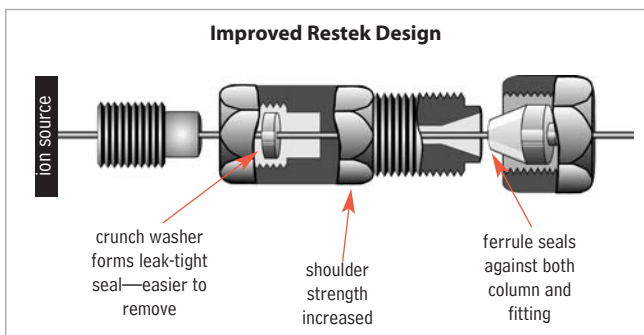
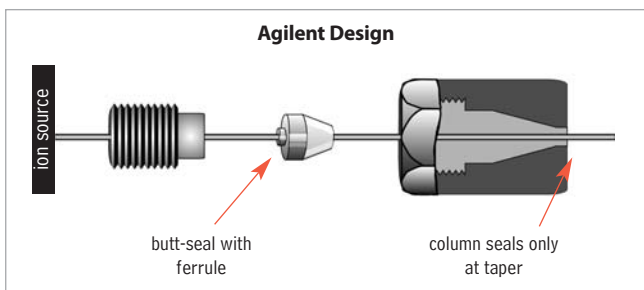
Description	qty.	cat.#	price
EZ No-Vent Connector Kit for Agilent 5971/5972, 5973, or 5975 GC/MS Kit includes: EZ No-Vent Connector, two 0.4mm ID ferrules for capillary column, two 0.4mm ID ferrules for transfer line, 100µm deactivated transfer line (3 ft.), column plug, column nut.	kit	21323	
Replacement 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	5-pk.	21900	
Replacement EZ No-Vent Plug	2-pk.	21915	
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 VespeI® 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 VespeI® or VespeI®/graphite 1/16-inch ferrule.
- Includes a 1/16-inch stainless steel nut and two replacement sealing rings. Order ferrules separately.
- Improved design reduces chance of leaks.



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



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

For VespeI ferrules, see page 210.

Restek MSD Source Nut

- 1.2mm nut bore permits easy removal of ferrules with a standard tapered-needle file (cat.# 20106, page 208).
- 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!

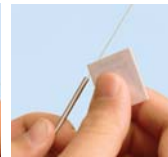


Capillary Installation Gauge for Agilent 5973/5975 MS

- 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



23074

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

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

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 $\sim 1,000\text{mm}^2$ compared to a standard continuous dynode multiplier that only has a total channel surface area of around 106mm^2 . The increased surface area of the ETP slows the aging process and improves operating life.

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

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

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

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	



Technical Service

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

Contact us:

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

In the U.S.

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

Outside the U.S.

Contact your Restek representative.



22662

Replacement Diffusion Pump Fan Assemblies for Agilent 5971/5972 MS

- 110/120 VAC

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

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

Inland 45 Pump Oil

Recommended for most mass spectrometers.

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



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-2pair)
- 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-2pair)
- 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	ea.	22068	
Injector/FID Heater	19231-60620	ea.	22069	
Injector/FID PRT Sensor	19231-60660	ea.	23035	



FID Base Weldment for Agilent GCs

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

Description	Similar to Agilent part #	qty.	cat.#	price
FID Base Weldment for Agilent 5890 GCs	19231-80580	ea.	23041	
FID Base Weldment, Pack Column FID, for Agilent 6850/6890 GCs	G1531-80580	ea.	23052	
FID Base Weldment, Capillary Column FID, for Agilent 6850/6890 GCs	G1531-80630	ea.	23053	

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

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	

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..

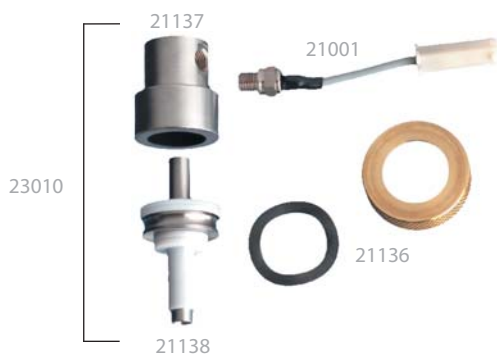


...then turn counterclockwise...



...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	
	19231-20970			
	19231-20960			
FID Collector (includes insulators)	19231-20950	ea.	21138	
	19231-20940			
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	
	G1531-20690			
FID Collector (includes insulators)	G1531-20700	ea.	21139	
	19231-20940			
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 250psi (1,724kPa).
- Rated for outlet pressures of 0 to 60psi (0-414kPa).



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 by instrument manufacturer's parts.
- Parts list makes reordering easy.

FID kits include:

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



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

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



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

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



Similar to Agilent part #	qty.	cat.#	price	qty.	cat.#	price
Standard, 0.011-Inch ID Tip						
G1531-80560	ea.	21621		3-pk.	21682	
High-Performance Siltek Treated, 0.011-Inch ID Tip						
G1531-80560	ea.	21620		3-pk.	21683	
High-Temperature, 0.018-Inch ID Tip						
G1531-80620	ea.	23078		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.

Similar to Agilent part #	qty.	cat.#	price	qty.	cat.#	price
Standard, 0.018-Inch ID Tip						
18710-20119	ea.	21694		3-pk.	21695	
High-Performance Siltek Treated, 0.018-Inch ID Tip						
18710-20119	ea.	21696		3-pk.	21697	
Similar to Agilent part #	qty.	cat.#	price	qty.	cat.#	price
Standard, 0.030-Inch ID Tip						
18789-80070	ea.	21688		3-pk.	21689	
High-Performance Siltek Treated, 0.030-Inch ID Tip						
18789-80070	ea.	21686		3-pk.	21687	



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.

restek
innovation!



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.



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

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	



FID/Injector Cleaning Kit

The FID/Injector Cleaning Kit includes:

- Nylon tube brushes (1/8", 3/16", 1/4").
- Pipe cleaner.
- Stainless steel tube brushes (3/8", 3/16", 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	

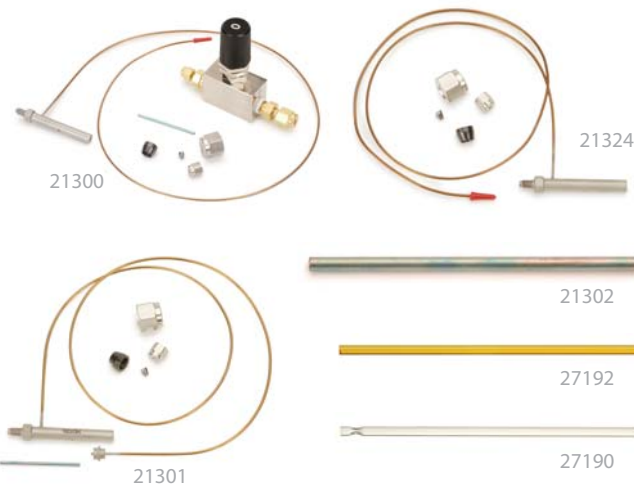


22077

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	

also **available**Looking for more detector replacement parts? See **page 199**.

21324

21300

21302

27192

27190

21301

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

Each kit below offers different combinations of fittings and supplies based on your individual instrument needs.

Description	Similar to Agilent part #	qty.	cat. #	price
ECD/FID Dual-Purpose Make-Up Gas Kit Includes: make-up gas fitting, Siltek treated guide, $\frac{1}{4}$ " nut and ferrule, $\frac{1}{16}$ " nut, 0.4mm ID graphite ferrule, and fine metering valve		kit	21300	
Replacement Make-up Gas Fitting Kit Includes: make-up gas fitting, $\frac{1}{4}$ " nut and ferrule, $\frac{1}{16}$ " nut, 0.4mm ID graphite ferrule		kit	21324	
ECD/FID Replacement Fitting Kit with Flow Manifold Connection Includes: replacement fitting, $\frac{1}{4}$ " nut, Vespel/graphite ferrule, $\frac{1}{16}$ " nut, 0.4mm ID graphite ferrule, Siltek treated guide		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	

**Catch the Buzz**

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

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	
Replacement Cables	35900-60610	6 ft.	2-pk.	20651	



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

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



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

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



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	
Replacement Cables	35900-60630	6 ft.	2-pk.	20659	



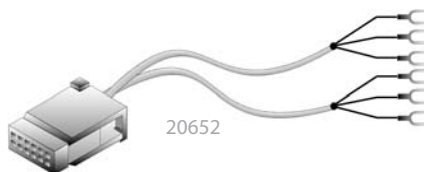
Connect an Agilent 3396 integrator to remote-start another piece of equipment or to start the Agilent 3396 integrator from that other piece of equipment.

Description	Similar to Agilent part #	length	qty.	cat. #	price
Replacement Cable	03394-60540	6 ft.	ea.	20655	
Replacement Cables	03394-60540	6 ft.	2-pk.	20656	



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	
Replacement Cables	35900-60700	6 ft.	2-pk.	20661	



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	
Replacement Cables	05890-60800	6 ft.	2-pk.	20653	



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 5890 GCs	18597-60805	ea.	21236	
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**

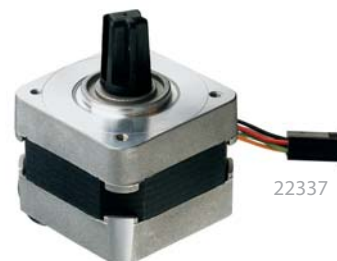
Description	Similar to Agilent part #	qty.	cat.#	price
Carriage Motor Belt for Agilent 7673A and 7673B	1500-0676	ea.	22692	

**Z-Belt for Agilent 7673B Autosampler**





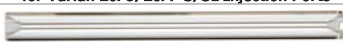











Description	Similar to Agilent part #	qty.	cat.#	price
Z-Belt for Agilent 7673B Autosampler	1500-0803	ea.	22332	

**Carriage Motor for Agilent 7673A & 7673B Autosamplers**

Description	Similar to Agilent part #	qty.	cat.#	price
Carriage Motor for Agilent 7673A and 7673B	07673-60890	ea.	22693	

**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	

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
2mm Splitless							
		trace samples >2µL	4.0mm 6.3mm x 74mm	—	20904	20905	20906
4mm Splitless							
		trace, active samples up to 4µL	4.0mm 6.3mm x 74mm	—	20847	20848	20849
Double Gooseneck							
		trace, dirty, active samples up to 4µL	4.0mm 6.3mm x 74mm	—	20897	20898	—
Cyclo Double Gooseneck							
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	—
1mm Split							
		universal, use with rapid autosamplers	4.0mm 6.3mm x 72mm	190010901	20792	20793	20794
Splitter w/Wool							
		high MW compounds	4.0mm 6.3mm x 72mm	190010902	20803	20804	—
Laminar Cup Splitter							
		high & low MW compounds	4.0mm 6.3mm x 72mm	—	20724	20725	—
Cup Splitter							
		dirty samples, many injections before cleaning required	4.0mm 6.3mm x 72mm	—	20727	20728	—
Cyclo splitter							
		dirty samples, non-active compounds	4.0mm 6.3mm x 72mm	190010903	20715	20716	20717
Frit Splitter							
		compounds with close boiling points	4.0mm 6.3mm x 72mm	190010904	20718	20719	20720
Baffle Splitter							
		dirty samples, active samples	4.0mm 6.3mm x 72mm	—	21030	21031	—
Split Precision Liner w/Wool							
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	—
Uniliner							
		trace, dirty, high MW, active samples, linearity	4.0mm 6.3mm x 72mm	—	20347	20348	—
Cyclo-Uniliner							
		trace, dirty, active samples, high recovery & linearity	4.0mm 6.3mm x 72mm	—	20845	20846	—
Open-top Uniliner w/Wool							
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 6.30mm x 74mm	—	21112	21113	—
SPME Liner							

*Nominal ID at syringe needle expulsion point.

All liners are
100%
deactivated

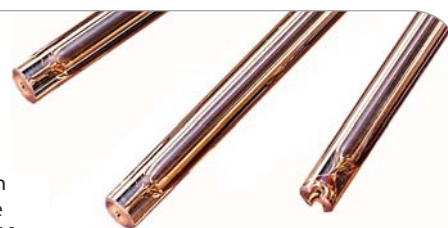
All liners are shipped intermediate polarity (IP)
deactivated unless otherwise requested.






Restek can provide any of the liners shown deactivated according to any of our three proprietary processes, including our highly inert Siltek® coating. The processes are described on **page 140** and ordering information is on **page 143**.









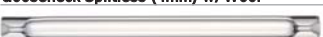




Packing materials, including wool and CarboFrits™, can be provided in any liner—subject to the liner ID and geometry. Packing materials are described on **page 141** and ordering information is on **pages 143-144**.



Siltek® Treated Liners

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

Liners for Varian 1177 S/SL Injection Ports	Benefits/Uses:	ID* OD x Length	Similar to Varian part #	ea.	cat.# /price 5-pk.	25-pk.
 4mm Split w/Glass Frit	universal	4.0mm 6.3mm x 78.5mm	—	21045	21046	—
 4mm Split w/Wool	universal	4.0mm 6.3mm x 78.5mm	392611934	—	21079	—
 4mm Split Precision Liner w/Wool	dirty samples, trace samples	4.0mm 6.3mm x 78.5mm	—	20759	20762	—
 Low Pressure Drop Precision Liner w/Wool	trace samples <2μL, dirty samples	2.0mm 6.3mm x 78.5mm	—	22421	22422	—
 Laminar Cup Splitter	high MW compounds	4.0mm 6.3mm x 78.5mm	—	20765	20768	—
 2mm Splitless w/Wool	trace samples <2μL	2.0mm 6.5mm x 78.5mm	392599903	—	21077	—
 Gooseneck Splitless (4mm)	trace samples <2μL	4.0mm 6.5mm x 78.5mm	392611927	21896	21897	—
 Gooseneck Splitless (4mm) w/Wool	trace samples <2μL	4.0mm 6.5mm x 78.5mm	392611936	21896-200.1	21897-200.5	—
 Double Gooseneck Splitless (4mm)	trace, active samples <2μL	4.0mm 6.5mm x 78.5mm	—	21891	21892	—

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

*Nominal ID at syringe needle expulsion point.

All liners are
100% deactivated

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



Restek can provide any of the liners shown deactivated according to any of our three proprietary processes, including our highly inert Siltek® coating. The processes are described on **page 140** and ordering information is on **page 143**.











Packing materials, including wool and CarboFrits™, can be provided in any liner—subject to the liner ID and geometry. Packing materials are described on **page 141** and ordering information is on **pages 143-144**.



Siltek® Treated Liners

COLUMN INSTALLS THIS END

Liners for Varian 1078/1079 Injection Ports	Benefits/Uses:	ID* OD x Length	Similar to Varian part #	ea.	cat.#/price 5-pk.	25-pk.
 1078/1079 Split w/Frit	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 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.



Restek can provide any of the liners shown deactivated according to any of our three proprietary processes, including our highly inert Siltek® coating. The processes are described on **page 140** and ordering information is on **page 143**.



Packing materials, including wool and CarboFrits™, can be provided in any liner—subject to the liner ID and geometry. Packing materials are described on **page 141** and ordering information is on **pages 143-144**.



Siltek® Treated Liners

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	



Inlet Liner Seals for Varian 1177 Injectors

- Meets or exceeds original manufacturer's performance.



Description	Max. temp.	Similar to Varian part #	10-pk. cat.#	50-pk. cat.#
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

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

IceBlue®



Precision molded!

BTO®

Thermolite®

Septa for Varian GCs

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

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

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

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

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

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

Injector Type

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

HANDY
septum size chart



20881

Capillary Nuts for Varian GCs

- Choose brass or stainless steel construction.

Description	Similar to Varian part #	qty.	cat.#
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.#
Siltek Treated Inlet Support Springs for Varian	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.#
Capillary Installation Gauge for Varian GCs for use with 1/16" ferrules	ea.	22335

*Recommended for use with graphite ferrules.

also available

Looking for ferrules?
See pages 210-212.



also available

Looking for packed column accessories for Varian instruments?
See pages 193-195.



Everything you need
in one complete kit!



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

Description	qty.	cat.#	price
MLE Capillary Tool Kit for Varian GCs	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	

restek
innovation!

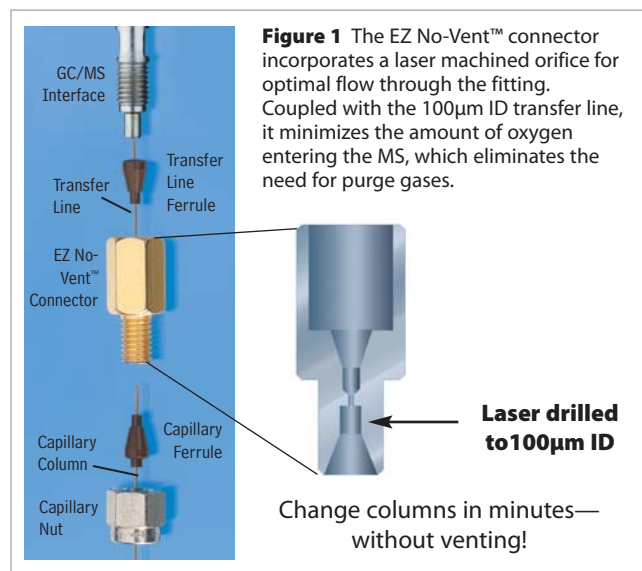
Kit installs easily,
without special tools
or plumbing.

EZ No-Vent™ GC Column-Mass Spectrometer Connector












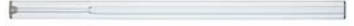

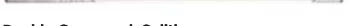
- Change GC/MS columns in minutes without venting—100µm transfer line throttles vacuum and prevents venting.
- Easy to install and maintain—no special tools or plumbing required.
- Gold-plated body for inertness.
- Deactivated transfer line keeps analytes focused; high-temperature polyimide ferrules eliminate leaks at the problematic transfer line fitting.
- Lower cost than other “no-vent” fittings.
- For Varian Saturn 2000 Series Mass Spectrometers.



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 in 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 downtime 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
EZ No-Vent Connector Kit for Varian Saturn 2000 Series MSs Kit includes: EZ No-Vent Connector, two 0.4mm ID ferrules for capillary column, two 0.4mm ID ferrules for transfer line, 100µm deactivated transfer line (3 ft.), column plug, column nut.	kit	22423	
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	5-pk.	21900	
Replacement EZ No-Vent Plug	2-pk.	21915	
Open-End Wrenches (1/4" x 3/16")	2-pk.	20110	

Split Liners for Shimadzu 14A GCs		Benefits/Uses:	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.#/price 5-pk.	25-pk.
	Split	universal, for most common analyses	3.5mm	221-32544-01	20860	20861	20862
			5.0mm x 99mm				
	Cyclo splitter	dirty samples, many injections before cleaning required	3.5mm	—	20870	20871	—
			5.0mm x 99mm				
	Laminar Cup Splitter	high MW compounds	3.5mm	—	20868	20869	—
			5.0mm x 99mm				
Splitless Liners for Shimadzu 14A GCs		Benefits/Uses:	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.#/price 5-pk.	25-pk.
	3.5mm Splitless	trace samples	3.5mm	221-32544-00	20863	20864	20865
			5.0mm x 99mm				
DI Liners for Shimadzu 14A GCs (0.25/0.32/0.53mm ID)		Benefits/Uses	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.#/price 5-pk.	25-pk.
	Uniliner	trace, active samples, high recovery & linearity	3.5mm	—	20876	20877	—
			5.0mm x 99mm				
	Cyclo-Uniliner	trace, dirty, high MW active samples, high recovery & linearity	3.5mm	—	20893	20894	—
			5.0mm x 99mm				
Split Liners for Shimadzu 17A, 2010, and 2014 GCs		Benefits/Uses:	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.#/price 5-pk.	25-pk.
	1mm Split	purge & trap, fast GC	1.0mm	—	20976	20977	20978
			5.0mm x 95mm				
	3.5mm Split	universal, for most common analyses	3.5mm	221-41444-01	22283	22284	22285
			5.0mm x 95mm				
	Split Precision Liner w/Wool	dirty samples, trace samples	3.5mm	—	21020	21021	—
			5.0mm x 95mm				
	Cyclo splitter	dirty samples, many injections before cleaning required	3.5mm	—	22072	22073	—
			5.0mm x 95mm				
	Laminar Cup Splitter	high MW compounds	3.5mm	NEW!	22981	22982	—
			5.0mm x 99mm				
Splitless Liners for Shimadzu 17A, 2010, and 2014 GCs		Benefits/Uses:	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.#/price 5-pk.	25-pk.
	2mm Gooseneck Splitless	universal, trace samples	2.0mm	NEW!	22276	22277	—
			5.0mm x 95mm				
	3.5mm Gooseneck Splitless	universal, trace samples	3.5mm	221-48335-01	22286	22287	—
			5.0mm x 95mm				
	Double Gooseneck Splitless	reduces backflash and catalytic decomposition	3.5mm	NEW!	22274	22275	—
			5.0mm x 95mm				

*Nominal ID at syringe needle expulsion point.

All liners are
100%
deactivated

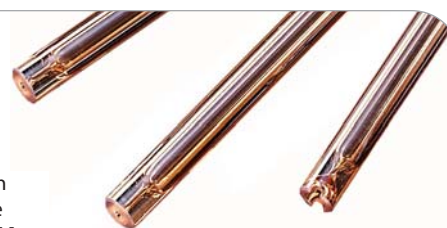
All liners are shipped intermediate polarity (IP) deactivated unless otherwise requested.











Restek can provide any of the liners shown deactivated according to any of our three proprietary processes, including our highly inert Siltek® coating. The processes are described on **page 140** and ordering information is on **page 143**.



Packing materials, including wool and CarboFrits™, can be provided in any liner—subject to the liner ID and geometry. Packing materials are described on **page 141** and ordering information is on **pages 143-144**.



Siltek® Treated Liners

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	.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.

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.



Restek can provide any of the liners shown deactivated according to any of our three proprietary processes, including our highly inert Siltek® coating. The processes are described on **page 140** and ordering information is on **page 143**.



Packing materials, including wool and CarboFrits™, can be provided in any liner—subject to the liner ID and geometry. Packing materials are described on **page 141** and ordering information is on **pages 143-144**.



Siltek® Treated Liners

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 Siltek Treated Metal Inlet Liners w/Wool	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 17A, 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	



Plug Septa 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, 0.4mm 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

5mm Ferrules for Shimadzu 17A GCs

- For use with packed columns.
- Graphite composition.

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 0.8mm sizes.
- Packaged on mandrel for easy handling.

Ferrule ID	Fits Column ID	qty.	cat. #	price
0.4mm	0.25mm and less	10-pk.	24827	
0.5mm	0.32mm	10-pk.	24828	
0.8mm	0.53mm	10-pk.	24829	



20312

5mm Stainless Steel Uniliner® Liner Adaptor Fitting for Shimadzu Packed Column GCs

Shimadzu GCs do not require a standard 1/4-inch Uniliner® liner adaptor because the injection port cavity will accept 5mm Uniliner® liners. This specially-designed fitting allows a Shimadzu packed column injection port to accept 0.53mm ID columns. Use a Shimadzu 5mm nut and ferrule to install the adaptor fitting into the injection port. Includes a 1/16-inch nut and 0.8mm ID graphite ferrule.

Description	qty.	cat.#	price
5mm Stainless Steel Uniliner Liner Adaptor Fitting for Shimadzu Packed Column GCs	ea.	20312	



21159

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	



22333

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	



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 230-233 for more information.



22334

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	



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 (0.25–0.65mm OD)
- 1/4" x 3/16" open end wrench
- 3/8" x 7/16" open end wrench
- 6mm x 7mm open end wrench
- 8mm x 10mm open end wrench
- 16mm x 17mm 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
- 15cm compact steel ruler
- pocket magnifier
- high temperature string (1 meter)
- pipe cleaner (12-inch)
- cotton tip swabs (pk. of 25)

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

Split Liners for PerkinElmer GCs	Benefits/Uses:	ID* OD x Length	Similar to PE part #	ea.	cat.# / price 5-pk.	25-pk.
 Baffle Splitter	universal, for most common analyses	3.5mm 5.0mm x 100mm	N6502008	20736	20737	—
 Cup Splitter	high & low MW compounds	3.5mm 5.0mm x 100mm	—	20739	20740	—
 Cyclosplitter	dirty samples, many injections before cleaning required	3.5mm 5.0mm x 100mm	—	20745	20746	—
 Auto SYS Splitter w/Wool	universal for most common analyses	4.0mm 6.2mm x 92.1mm	N6502009	20832	20833	20834
 Auto SYS Cup Splitter	high & low MW compounds	4.0mm 6.2mm x 92.1mm	N6502011	20835	20836	—
 Auto SYS Cyclosplitter	dirty samples, many injections before cleaning required	4.0mm 6.2mm x 92.1mm	N6502012	20910	20911	—
 Auto SYS Laminar Cup Splitter	high MW compounds	4.0mm 6.2mm x 92.1mm	—	20827	20828	—
 Auto SYS Split Precision Liner w/Wool	dirty samples, trace samples	4.0mm 6.2mm x 92.1mm	N6121020	21026	21027	—
Splitless Liners for PerkinElmer GCs	Benefits/Uses:	ID* OD x Length	Similar to PE part #	ea.	cat.# / price 5-pk.	25-pk.
 Splitless (2mm ID)	trace samples	2.0mm 5.0mm x 100mm	N6502007	20730	20731	20732
 Auto SYS Splitless	headspace & purge & trap	1.0mm 6.2mm x 92.1mm	N6502006	21272	21273	21274
 Auto SYS Splitless w/Wool (2mm ID)	trace samples	2.0mm 6.2mm x 92.1mm	N6121021	20829	20830	20831 enquire
 Auto SYS Double Gooseneck	trace, active samples up to 4µL	4.0mm 6.2mm x 92.1mm	N6502003	20853	20854	—
 Auto SYS Cyclo Double Gooseneck	trace, dirty, active samples, up to 4µL	4.0mm 6.2mm x 92.1mm	N6502005	20899	20900	—
PSS Liners for PerkinElmer GCs	Benefits/Uses:	ID* OD x Length	Similar to PE part #	ea.	cat.# / price 5-pk.	25-pk.
 PSS Split/Splitless (1mm ID)	trace samples	1.0mm 4.0mm x 86.2mm	N6121006	20738	20741	—
 Auto SYS XL PSS Split/Splitless w/Wool	most common analyses	2.0mm 4.0mm x 86.2mm	N6121004	21717	21718	—
 PSS Drilled Uniliner (hole near top)	trace, active samples, high recovery & linearity	2.0mm 4.0mm x 86.2mm	—	22986	22987	—
 PSS Drilled Uniliner (hole near bottom)	trace, active samples, high recovery & linearity	2.0mm 4.0mm x 86.2mm	—	22988	22989	—

*Nominal ID at syringe needle expulsion point.

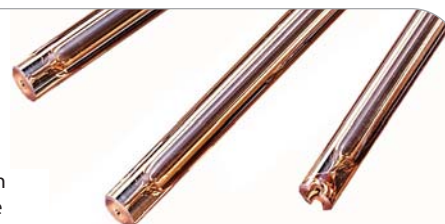
All liners are **100% deactivated** unless otherwise requested. All liners are shipped intermediate polarity (IP) deactivated unless otherwise requested.

















Restek can provide any of the liners shown deactivated according to any of our three proprietary processes, including our highly inert Siltek® coating. The processes are described on **page 140** and ordering information is on **page 143**.



Packing materials, including wool and CarboFrits™, can be provided in any liner—subject to the liner ID and geometry. Packing materials are described on **page 141** and ordering information is on **pages 143-144**.



Siltek® Treated Liners

Zero Dilution Liners for PerkinElmer Auto SYS and Clarus GCs		Benefits/Uses:	ID* OD x Length	Similar to PE part #	ea.	cat.# / price 5-pk.	25-pk.
		headspace analysis	1.0mm 2.0mm x 73mm	N1011446	22990	22991	—
Zero Dilution Inner Liner							
		headspace analysis	2.5mm 6.2mm x 90mm	N1011445	22992	22993	—
Zero Dilution Outer Liner							
Zero Dilution Liners for PerkinElmer GCs with PSS Inlets		Benefits/Uses:	ID* OD x Length	Similar to PE part #	ea.	cat.# / price 5-pk.	25-pk.
		headspace analysis	1.0mm 2.0mm x 73mm	N1011446	22990	22991	—
Zero Dilution Inner Liner							
		headspace analysis	2.5mm 4.2mm x 83mm	N1011447	24978	24979	—
Zero Dilution Outer Liner							
PTV Liners for PerkinElmer GCs		Benefits/Uses:	ID* OD x Length	Similar to PE part #	ea.	cat.# / price 5-pk.	25-pk.
		high linearity for 0.25, 0.32, & 0.53mm ID columns	1.0mm 2.0mm x 88mm	—	20733	20734	20735
PTV Press-Tight							
		high linearity	1.0mm 2.0mm x 88mm	—	20742	20743	20744
1.0mm PTV Liner							
DI Liners for PerkinElmer GCs (0.32/0.53mm ID)		Benefits/Uses:	ID* OD x Length	Similar to PE part #	ea.	cat.# / price 5-pk.	25-pk.
		trace, active samples, high recovery & linearity	3.5mm 5.0mm x 100mm	N6502018	20855	20856	—
Uniliner							
		trace, dirty, active samples, high linearity	3.5mm 5.0mm x 100mm	N6502019	20857	20858	—
Cyclo-Uniliner							
		trace, dirty, active samples, high recovery & linearity	4.0mm 6.2mm x 92.1mm	N6502016	20837	20838	—
Auto SYS Open-top Uniliner w/Wool							
		trace, dirty, high MW active samples, high linearity	4.0mm 6.2mm x 92.1mm	N6502017	20839	20840	—
Auto SYS Cyclo-Uniliner							
DI Liners for PerkinElmer GCs (For 0.32/0.53mm ID Columns)		Benefits/Uses	ID* OD x Length	Similar to PE part #	ea.	cat.# / price 5-pk.	25-pk.
		trace, active samples, high recovery & linearity	4.0mm 6.2mm x 92.1mm	N6121022	20819	20822	—
Auto SYS Drilled Uniliner (hole near top)							
		trace, active samples, high recovery & linearity	4.0mm 6.2mm x 92.1mm	N6502013	21293	21294	—
Auto SYS Drilled Uniliner (hole near bottom)							
		trace, active samples, high recovery & linearity	4.0mm 6.2mm x 92.1mm	N6502014	21295	21296	—
Auto SYS Gooseneck Drilled Uniliner (hole near top)							
		trace, active samples, high recovery & linearity	4.0mm 6.2mm x 92.1mm	N6502015	21297	21298	—
Auto SYS Gooseneck Drilled Uniliner (hole near bottom)							

*Nominal ID at syringe needle expulsion point.



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.

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 Clarus GCs w/PSS Injector	450°C	N610-1751	10-pk.	21475	
	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®

11mm Septa 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

Septum Cap for PerkinElmer Auto SYS XL

- Made of clear anodized aluminum and high-quality stainless steel.
- Meets or exceeds original manufacturer's performance.



22322

Description	Similar to PE part #	qty.	cat.#	price
Septum Cap for PerkinElmer Auto SYS XL	N6100153	ea.	22322	



Injector Adaptor for PerkinElmer Auto SYS XL

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

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

For use with 1/8" compression style nuts

Injector Adaptor for PerkinElmer Auto SYS XL	—	ea.	22319	
Siltek Treated Injector Adaptor for PerkinElmer Auto SYS XL	—	ea.	22321	



FID Capillary Column Adaptor for PerkinElmer Auto SYS XL

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

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

For use with 1/8" compression style nuts

FID Capillary Column Adaptor for PerkinElmer Auto SYS XL	—	ea.	22609	
--	---	-----	-------	--



also available

Looking for packed column parts for PerkinElmer instruments?
See pages 193-195.



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	



MLE
Make Life Easier!

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 (0.25–0.65mm 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
- 15cm compact steel ruler
- pocket magnifier
- high temperature string (1 meter)
- pipe cleaner (12-inch)
- cotton tip swabs (pk. of 25)

Description	qty.	cat.#	PRICE
MLE Capillary Tool Kit for PerkinElmer GCs	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	



The Claw and The Claw Holder Kit

- Easily removes hot liners from injection ports.
- 4mL vials (not included) can be changed out and disposed of 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 4mL 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	
4.0mL Clear Vial, White Graduated Marking Spot	100-pk.	24658	



















also **available**

Restek now carries Swagelok fittings in brass & stainless steel. See pages 237-239 or visit www.restek.com and search on Swagelok.



Supplies for Thermo Scientific GCs: Liners

Split Liners for Thermo Scientific 4000-5000-6000 Series GCs		Benefits/Uses:	ID* OD x Length	Similar to TS part #	ea.	cat.#/price 5-pk.	25-pk.
	high MW compounds		4.0mm 5.4mm x 79.5mm	—	20809	20810	—
Laminar Cup Splitter							
	dirty samples, many injections before cleaning required		4.0mm 5.4mm x 79.5mm	—	20817	20818	—
Cyclosplitter							
	high & low MW compounds		4.0mm 5.4mm x 79.5mm	—	20885	20886	—
Cup Splitter Gooseneck							
Splitless Liners for Thermo Scientific 4000-5000-6000 Series GCs		Benefits/Uses:	ID* OD x Length	Similar to TS part #	ea.	cat.#/price 5-pk.	25-pk.
	trace samples		2.0mm 5.4mm x 79.5mm	—	20811	20812	20813
Splitless (2mm ID)							
	trace samples		4.0mm 5.4mm x 79.5mm	—	20814	20815	20816
Splitless (4mm ID)							
DI Liners for Thermo Scientific 4000-5000-6000 Series GCs (0.32/0.53 ID)		Benefits/Uses:	ID* OD x Length	Similar to TS part #	ea.	cat.#/price 5-pk.	25-pk.
	trace, dirty, active samples, high recovery & linearity		4.0mm 5.4mm x 79.5mm	—	20841	20842	—
Open-top Uniliner w/Wool							
Split Liners for Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL		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	—
1mm Split							
	universal		3.0mm 8.0mm x 105mm	453 20031	20936	20937	20938
3mm Split							
	universal		5.0mm 8.0mm x 105mm	453 20030	20939	20940	20941
5mm Split							
	high MW compounds		4.0mm 8.0mm x 105mm	—	20948	20949	—
Laminar Cup Splitter							
	high & low MW compounds		4.0mm 8.0mm x 105mm	—	20950	20951	—
Cup Splitter							
	dirty samples, trace samples		5.0mm 8.0mm x 105mm	—	22288	22289	—
5mm Split Precision Liner w/Wool							
Splitless Liners for Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL		Benefits/Uses:	ID* OD x Length	Similar to TS part #	ea.	cat.#/price 5-pk.	25-pk.
	trace samples		3.0mm 8.0mm x 105mm	453 20032	20942	20943	20944
Splitless (3mm ID)							
	trace samples		5.0mm 8.0mm x 105mm	453 20033	20945	20946	20947
Splitless (5mm ID)							
	trace, active samples up to 4µL		4.0mm 8.0mm x 105mm	—	20952	20953	—
Double Gooseneck							
	dirty samples, trace samples		5.0mm 8.0mm x 105mm	—	21028	21029	—
5mm Splitless Precision Liner w/Wool							

*Nominal ID at syringe needle expulsion point.







All liners are
100%
deactivated

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

See next page for ordering information.

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.
		trace samples, high recovery & linearity	1.0mm 2.75mm x 120mm	453 22054	21114	21115	—
1mm ID Glass Liner							
		universal	2.0mm 2.75mm x 120mm	453 22045	21116	21117	—
2mm ID Glass Liner							
		trace samples	2.0mm 2.75mm x 120mm	—	22074	22075	—
Baffle Liner							
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.
		trace, active samples, high recovery, & linearity	5.0mm 8.0mm x 105mm	—	21005	21006	—
Uniliner w/Wool							
		trace, active samples, high recovery, & linearity	5.0mm 8.0mm x 105mm	—	22411	22412	—
Drilled Uniliner (hole near top)							
		trace, active samples, high recovery, & linearity	5.0mm 8.0mm x 105mm	—	22413	22414	—
Drilled Uniliner (hole near bottom)							

*Nominal ID at syringe needle expulsion point.



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.



Restek can provide any of the liners shown deactivated according to any of our three proprietary processes, including our highly inert Siltek® coating. The processes are described on **page 140** and ordering information is on **page 143**.



Packing materials, including wool and CarboFrits™, can be provided in any liner—subject to the liner ID and geometry. Packing materials are described on **page 141** and ordering information is on **pages 143-144**.



Siltek® Treated Liners

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

*Works with PTV injectors.



Inlet Liner Seals for Thermo Scientific TRACE PTV



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

Graphite Sealing Ring for Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL Instruments



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



Septa 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
Thermolite Septa (usable to 340°C inlet temp.)			
9mm	27132	27133	27134
9.5mm (3/16")	27135	27136	27137
17mm	27150	27151	27152

IceBlue Septa (usable to 250°C inlet temp.)			
9mm	—	27156	27157
9.5mm (3/16")	—	27158	27159
17mm	—	27168	27169

BTO Septa (usable to 400°C inlet temp.)			
9mm CenterGuide	—	27104	27105
9.5mm (3/16")	—	27106	27107
17mm CenterGuide	—	27116	27117



BTO® septa is recommended for Thermo Scientific instruments, due to the average injection port temperature.

HANDY septum size chart

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

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



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



Septa Holder Kits for Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL

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

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

Gold-Plated Liner Cap for Split/Splitless Injector on Thermo Scientific TRACE, 8000, 8000 TOP & Focus SSL



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



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

Description	Similar to TS part #	qty.	cat.#	price
Silver Seal for Split/Splitless Injector	29033629	10-pk.	23057	
	29033629	20-pk.	23058	
Silver Seal for Capillary Detector Base Body	29037100	10-pk.	23059	
	29037100	20-pk.	23060	



Adapters for Capillary Columns on Thermo Scientific TRACE and Focus SSL

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

Description	Similar to TS part #	qty.	cat.#	price
For use with standard 1/8" ferrules.				
Adapter for Capillary Column on Detector Base	—	ea.	24916	
Adapter for Capillary Column on Split/Splitless Injector	—	ea.	24917	
Siltek Treated Adapter for Capillary Column on Split/Splitless Injector	—	ea.	20543	
For use with M4 ferrules.				
Adapter for Capillary Column on Detector Base	347 25 436	2-pk.	24969	
Adapter for Capillary Column on Split/Splitless Injector	347 05 451	ea.	24970	
Siltek Treated Adapter 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—For M4 Fittings for Thermo Scientific TRACE, 8000, 8000 TOP & Focus GCs



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

FID Jet for Thermo Scientific TRACE and Focus GCs

- Meets or exceeds original manufacturer's performance.



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

Jet Removing Tool for Thermo Scientific GCs: Focus GC / TRACE GC / Ultra/TRACE GC x GC

- Unique, ergonomic handle—easy to grip.
- Easily loosens the FID jet.



Remove FID
cell assembly.



Slip tool over
FID jet.



Turn counter-
clockwise to
loosen jet.



Use tweezers
(cat. #20101)
to remove jet.

Description	Similar to TS part #	qty.	cat.#	price
Jet Removing Tool for Thermo Scientific GCs	205 019 00	ea.	24936	

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 7mm, 8 x 10mm, and 16 x 17mm 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, 10mm.

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 (0.25–0.65mm OD)
- 1/4" x 3/16" open end wrench
- 3/8" x 1/16" open end wrench
- 6mm x 7mm open end wrench
- 8mm x 10mm open end wrench
- 16mm x 17mm 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
- 15cm compact steel ruler
- pocket magnifier
- high temperature string (1 meter)
- pipe cleaner (12-inch)
- cotton tip swabs (pk. of 25)

Description	qty.	cat.#	price
MLE Capillary Tool Kit for Thermo Scientific GCs	kit	22183	



ETP Electron Multipliers for Mass Spectrometry

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

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

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	

did you know?

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

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



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

- Change GC/MS columns in minutes without venting—100µm 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.
- For Thermo Scientific Focus DSQ GC Mass Spectrometers.



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 in 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 downtime with each column change. The EZ No-Vent™ connector easily attaches to the MS source without special tools or extra plumbing.

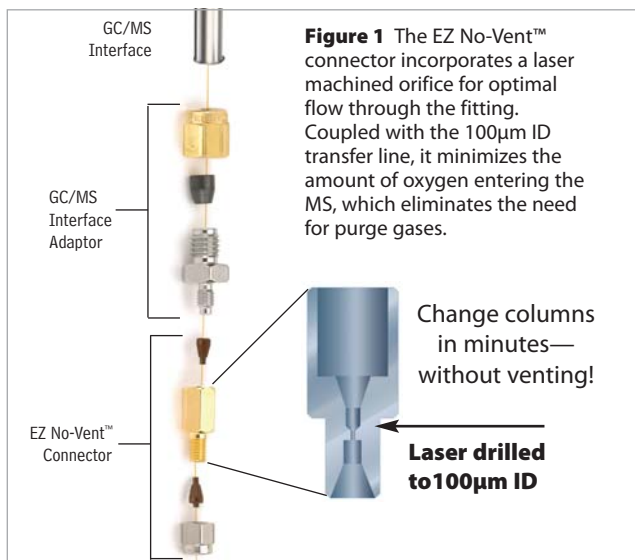





Figure 1 The EZ No-Vent™ connector incorporates a laser machined orifice for optimal flow through the fitting. Coupled with the 100µm ID transfer line, it minimizes the amount of oxygen entering the MS, which eliminates the need for purge gases.

Change columns in minutes—without venting!



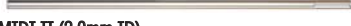
Laser drilled to 100µm ID

Description	qty.	cat.#	price
EZ No-Vent Connector Kit for Thermo Scientific Focus DSQ GC Mass Spectrometers Kit includes: EZ No-Vent Connector, two 0.4mm ID 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	5-pk.	21900	
Replacement EZ No-Vent Plug	2-pk.	21915	
Open-End Wrenches (1/4" x 5/16")	2-pk.	20110	
Open-End Wrenches (3/8" x 7/16")	2-pk.	22455	

Liners for ATAS Injectors

COLUMN INSTALLS THIS END	Liners for ATAS Injectors	Benefits/Uses:	ID* OD x Length	Similar to ATAS part #	ea.	cat.# / price 5-pk.
		universal	3.0mm 5.0mm x 80mm	—	22415	22416
	ATAS Open Liner, 3mm					
		trace, active samples <1µL	1.0mm 5.0mm x 80mm	A100049	22417	22418
	ATAS Open Liner, 1mm					
		dirty samples	3.0mm 5.0mm x 80mm	A100126	22419	22420
	ATAS Fritted Gooseneck					

Liners for APEX ProSep 800 & ProSep 800 Plus GCs

COLUMN INSTALLS THIS END	APEX Liners for ProSep 800 & ProSep 800 Plus GCs	Benefits/Uses:	ID* OD x Length	Similar to APEX part #	cat.# / price ea.
		injections ≤125µL	4.0mm 6.0mm x 243mm	L-00410	21075
	Mega IV (4.0mm ID)				
		injections ≤5µL	1.0mm 6.0mm x 243mm	L-00110	21073
	Micro I (1.0mm ID)				
		injections ≤25µL	2.0mm 6.0mm x 243mm	L-00210	21074
	MIDI II (2.0mm ID)				

*Nominal ID at syringe needle expulsion point.

ordering note

For additional liner ordering information, see pages 140-144.

Viton® O-Rings for Apex Liners



Description	Max. temp.	qty.	cat.#	price
Viton 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.



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	



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.

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

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 0.53mm 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 0.53mm 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 0.53mm ID fused silica columns (tubing OD ≥ 0.5mm).
- 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

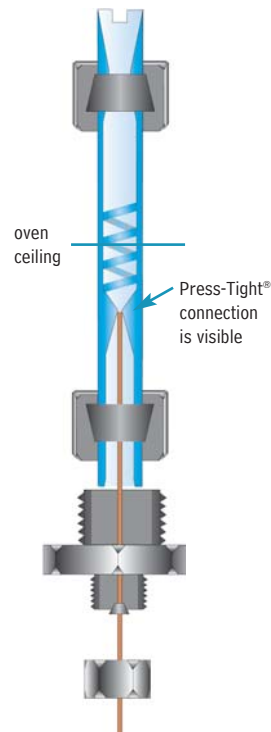
- Visually observe the Press-Tight® connection between the column end and liner.
- Fit 0.32 and 0.53mm ID capillary columns (column ODs from 0.5mm to 0.8mm).
- Slotted top prevents obstruction of carrier gas flow.
- Two designs available.
- Operate in the direct injection mode.



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.



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

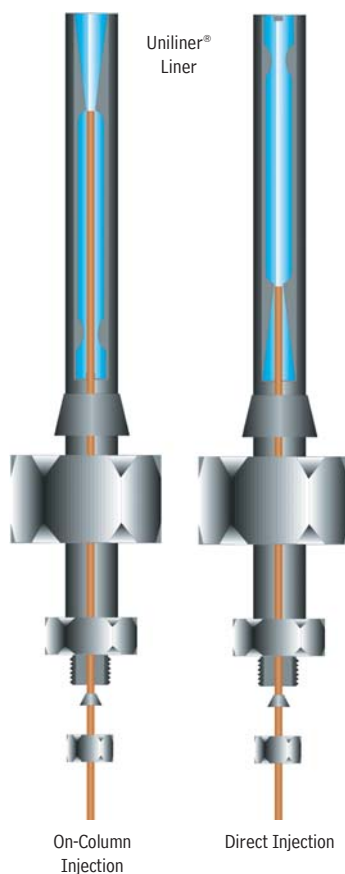
Includes a 1/4-inch stainless steel nut and graphite ferrule for attaching the liner to the GC inlet and a 1/4 to 1/16-inch stainless steel reducer, plus a 1/4-inch and 0.5mm ID graphite ferrule for attaching the column to the liner.

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








it's a **fact**

5mm 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—0.53mm 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 0.53mm ID columns because 26-gauge needles do not fit into the bore of 0.32mm ID columns, or into the Uniliner® liner taper.

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

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



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

	Stainless Steel	Siltek-Treated
For injection ports <8cm	20310	22282
For injection ports 8-15cm	20311	
For Shimadzu	20312	

1/4" Ferrules for Uniliner Liner Adaptor

cat.# 20234 (5-pk.)

*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 161**.

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	Liner Adaptor Fitting*: cat.# 20312	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	✓	✓		✓	✓
Shimadzu Packed Column GCs (5mm injection ports)** Models: GC-4, GC-6 thru 9, GC-14, GC-15, GC-16, GC-17, Mini, 2010	✓		✓		
PerkinElmer GCs (1/4-inch injection ports) Models: Sigma, 1B-4B, 300, 2001, 2100	✓	✓		✓	✓
PerkinElmer Auto SYS*	✓				

*Does not require Uniliner liner adaptor.

**See page 181 for 5mm Stainless Steel Uniliner Liner Adaptor Fitting.



Restek can provide any of the liners shown deactivated according to any of our three proprietary processes, including our highly inert Siltek® coating. The processes are described on **page 140** and ordering information is on **page 143**.



Packing materials, including wool and CarboFrits™, can be provided in any liner—subject to the liner ID and geometry. Packing materials are described on **page 141** and ordering information is on **pages 143-144**.

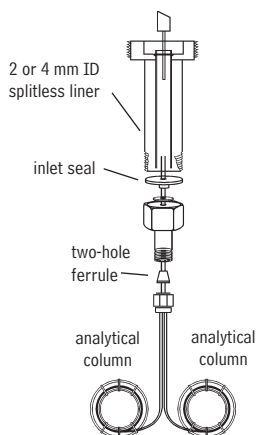


Siltek® Treated Liners

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

Split/Splitless Injection

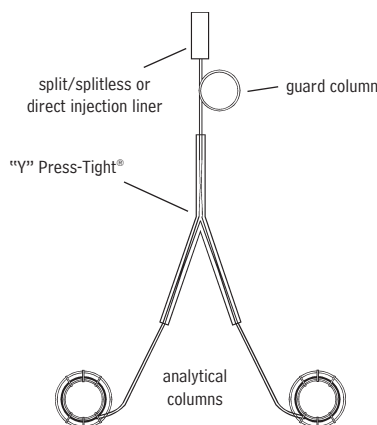
Two-hole ferrules allow dual-column confirmational analysis in the same split/splitless inlet.



0.25 and 0.32mm ID columns can be used with standard $\frac{1}{16}$ -inch inlet fittings (cat. # 27185). 0.53mm 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

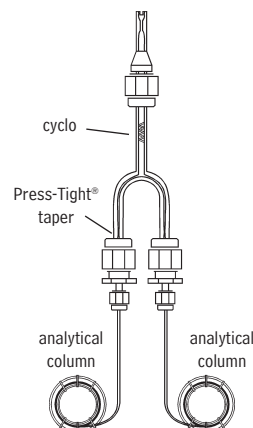
The "Y" Press-Tight® configuration allows dual columns to be used in either a split/splitless or direct injection inlet.



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 0.53mm 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 the 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 0.32mm or less (or 0.5mm OD) can be inserted directly into the $\frac{1}{16}$ -inch standard capillary fitting (cat.# 27185, page 197) by using a two-hole capillary ferrule. Columns with internal diameters of 0.53mm cannot be inserted into a standard $\frac{1}{16}$ -inch capillary fitting because the outside column diameter (0.8mm) 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 0.53mm ID column (cat.# 20645, page 197).*

On-column or Direct Injections

On-column or direct injections require a Press-Tight® connection to the inlet liner. Usually a section of 0.53mm ID guard tubing is attached to one leg of a Press-Tight® "Y" connector (cat.# 20405, page 198). 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 197) or *mini-Lam* Direct Injection Tee (cat.# 20436, page 197), 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 0.53mm 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 0.8mm) 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 0.8mm).
- 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	ferrule size	qty.	cat.#	price
0.5mm	1/16"	10-pk.	20201	
	1/16"	50-pk.	20228	
0.8mm	1/16"	10-pk.	20202	
	1/16"	50-pk.	20224	
1/4-inch	1/4"	10-pk.	20210	

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 1.2mm ID Dual Vespel® Ring Inlet Seal, and one 0.4mm ID two-hole ferrule.



27185

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



20645

1/8-Inch Capillary Inlet Adaptor Fitting Kit

(Split/splitless fitting for 0.53mm ID capillary columns)

Our specially engineered high-precision, 1/8-inch split/splitless fitting accepts standard two-hole capillary ferrules and a standard 1/8-inch nut. This design makes column installation easy because the nut protrudes 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 0.8mm ID two-hole ferrule.

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

Two-Hole Ferrules—For 1/8-Inch and 1/16-Inch Compression-Type Fittings

NEW!

0.4mm
and
0.5mm

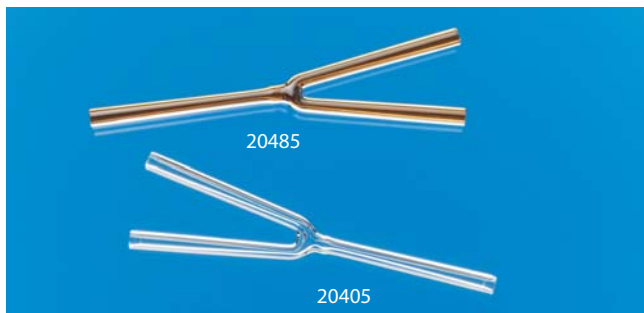
Fitting Size	Ferrule ID	Fits Column ID	qty.	Vespel/Graphite
1/16"	0.4mm	0.25/0.28mm	5-pk.	24848
1/16"	0.5mm	0.32mm	5-pk.	24849
1/8"	0.8mm	0.45/0.53mm	5-pk.	20246

also available

Please see our detailed GC column ferrule product listing on pages 210–212.

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 0.33–0.74mm (Restek 0.1mm–0.53mm ID).

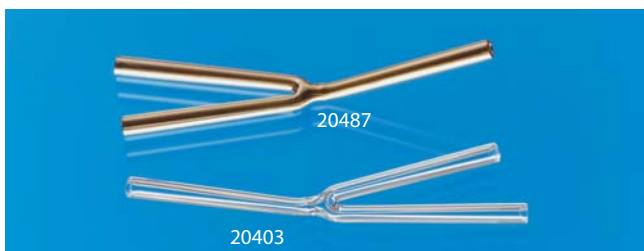


Universal “Y” Press-Tight® Connectors

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	20406
Deactivated	20405-261	20406-261
Siltek Treated	20485	20486



Universal Angled “Y” Press-Tight® Connectors

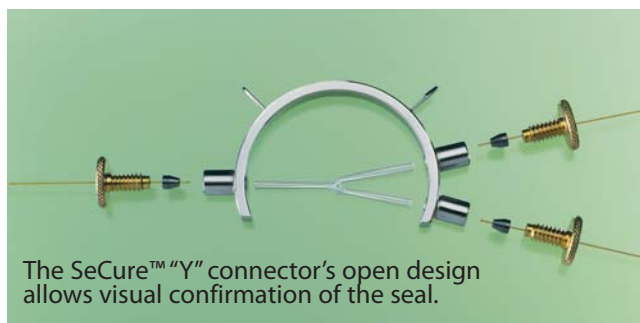
- Perform confirmation analysis with a single injection.
- Made from inert fused silica.
- Inlet and outlet ends conform to the column curvature—alleviates column-end connection strain.

Description	ea./price	3-pk./price
Universal Angled “Y” Press-Tight Connector	20403	20404
Deactivated	20403-261	20404-261
Siltek Treated	20487	20486

Polyimide Resin

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

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



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

SeCure™ “Y” Connector Kits

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

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



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 213–219**.

Replacement Accessories for Hall 1000



ELCD Nickel Reaction Tubes

- 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 Vespel/Graphite Sealing Ring	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	

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	qty.	cat. #	price
Fritted Spargers			
5mL Fritted Sparger, 1/2-inch mount	ea.	21150	
10mL Fritted Sparger, 1/2-inch mount	ea.	26138	
25mL Fritted Sparger, 1/2-inch mount	ea.	21151	
Non-Fritted Spargers			
5mL Non-Fritted Sparger, 1/2-inch mount	ea.	26139	
10mL Non-Fritted Sparger, 1/2-inch mount	ea.	26140	
25mL Non-Fritted Sparger, 1/2-inch mount	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 & Flow Meters	201-202
Column Installation Tools & Tool Kits	202-209
Ferrules	210-212
Connectors	213-219



Top: Scott Grossman, Applications Chemist
Bottom: Evan Johnstone, Shipping Technician



Restek Electronic Leak Detector

Why have a small leak turn into a costly repair? Protect your data 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, 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	1.0×10^{-5}	Red
Hydrogen*	1.0×10^{-5}	Red
Nitrogen	1.4×10^{-3}	Yellow
Argon	1.0×10^{-4}	Yellow
Carbon Dioxide	1.0×10^{-4}	Yellow

Description	qty.	cat.#	price
Leak Detector with Universal Charger Set (US, UK, European, Australian)	ea.	22839	
Soft-Side Carry/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.



Checking for leaks maintains the integrity of a GC system.



22839



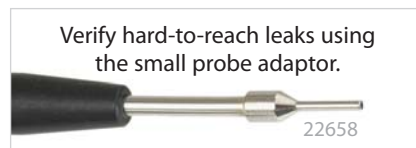
22839

Carrying/storage 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.



22658



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



Soap Film Bubble Flowmeter

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

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

Methane Cylinder Kit

(For optimizing linear velocity)

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.



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 50mL rinsing reservoir is equipped with 1/4-inch inlet and outlet connections and includes a built-in fritted disk to prevent particulate matter from contaminating the column. The kit includes: reservoir, pressure regulator, fittings, ferrules, and tubing. Reservoir also available separately.

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



FID Flow Measuring Adaptor 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	

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 0.8mm ID graphite ferrules.
- Viton® O-rings.
- Capillary nuts.
- Inlet seals.
- Reducing nut.
- Scoring wafer.
- 11mm Thermolite® septa.
- 4.0mm single gooseneck liner.
- 4.0mm 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.



FID kits include:

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



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



22185



22186



22182



22184



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

- $\frac{1}{8}$ ", $\frac{3}{16}$ ", $\frac{1}{4}$ " 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 (0.25–0.65mm 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
- 15cm 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
- 6mm x 7mm open end wrench
- 8mm x 10mm open end wrench
- 16mm x 17mm 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
- 6mm x 7mm open end wrench
- 8mm x 10mm open end wrench
- 16mm x 17mm 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	

Tools

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.



Hold tubing firmly in one hand, allowing about two inches to extend freely. Hold the scoring wafer at a 45° angle to the tubing. Exert just enough pressure to put a slight arc in the tubing. Pull perpendicularly across the tubing.



The tubing should fall off on its own, or it should easily break at the score with a slight tap of the wafer.

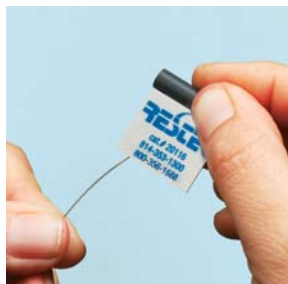


Check the cut against the white of the scoring wafer. Look for a clean, square cut.

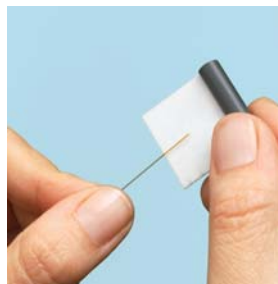
Description	qty.	cat.#	price
Scoring Wafer with Handle	2-pk.	23015	

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.



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.



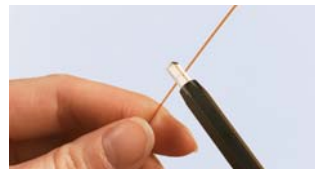
Check the cut against the white of the scoring wafer. Look for a clean, square cut.

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

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	



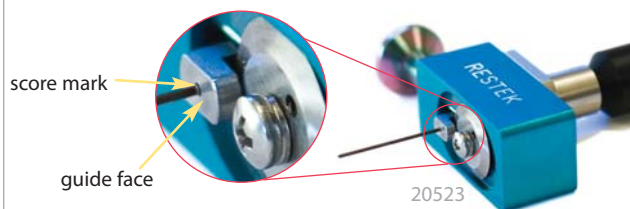
Shortix® Capillary GC Column Cutter

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



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.



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.

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!



21034



21399



22330



22335



22333

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.



21894

Capillary Installation Gauge for Agilent 5973/5975 MS

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



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



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



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

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



22858



21044

Capillary Column Caps

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

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



did you know?

Restek carries a complete line of replacement parts for Agilent GCs. See **pages 146-172** for more information.

Tools

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.



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	

**NEW!****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 changed out and disposed of 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 4mL 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	
4.0mL Clear Vial, White Graduated Marking Spot	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	

Injector/Detector Plug Nut

- 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
Detector Plug Nut	5020-8294	2-pk.	21883	

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 $\frac{1}{16}$ " compression fitting	ea.	23016	
Rethreading Tool for $\frac{1}{8}$ " compression fitting	ea.	23017	
Rethreading Tool for $\frac{1}{4}$ " compression fittings (Agilent split/splitless injection ports)	ea.	23018	
Rethreading Tool for $\frac{7}{16}$ " compression fitting (Varian injection ports)	ea.	23019	
Rethreading Tool for $\frac{1}{4}$ " 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
$\frac{1}{4}$ " x $\frac{5}{16}$ " 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 $\frac{1}{4}$ " x $\frac{5}{16}$ ", $\frac{3}{8}$ " x $\frac{7}{16}$ ", $\frac{7}{16}$ " x $\frac{1}{2}$ ", and $\frac{1}{2}$ " x $\frac{9}{16}$ " 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	qty.	cat.#	price
Open-End Wrenches ($\frac{1}{4}$ " x $\frac{5}{16}$ ")	2-pk.	20110	
Open-End Wrenches ($\frac{7}{16}$ " x $\frac{1}{2}$ ")	2-pk.	22455	



Metric Wrench Set

High-quality 6 x 7mm, 8 x 10mm, and 16 x 17mm 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, 10mm.

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	

Torx is a registered trademark of Textron Inc.



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 15cm 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	

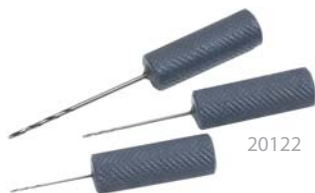


21601

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 0.53mm ID (0.4, 0.5, and 0.8mm 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.



22066

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

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



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 203**.

restek innovation!

24918

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.

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

restek innovation!

24937

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.

Description	Similar to TS part #	qty.	cat.#	price
Liner Cap Removing Tool for Thermo Scientific GCs	205 070 10	ea.	24937	

**tech tip****Choosing the Right Ferrule**

Although graphite and Vespel®/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. Vespel®/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 Vespel®/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



Reusable!

graphite ferrules



graphite ferrules

Vespel® Ferrules

- 100% high-temperature polyimide.
- Stable to 350°C.
- Durable, leak-tight.



Vespel® 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.

Vespel®/Graphite Ferrules

- 60%/40% Vespel®/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 Vespel®, graphite, or Vespel®/graphite.

Ferrule ID	Fits Column ID	qty.	Vespel	Graphite	Vespel/Graphite
0.3mm	< 0.18mm	10-pk.	22213	20233	20275
0.4mm	0.18/0.25/0.28mm	10-pk.	22214	20200	20211
0.4mm	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 Vespel®/graphite.

Ferrule ID	Fits Column ID	qty.	Graphite	Vespel/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	21056
1.6mm	1.00mm*	10-pk.	21061	21057

*For micropacked columns.

**For 0.28mm 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 & 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

**5mm Ferrules for Shimadzu 17A GCs**

- For use with **packed columns**.
- Graphite construction.

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

**Graphite Ferrules for Shimadzu 17A, 2010, & 2014 GCs**

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

Ferrule ID	Fits Column ID	qty.	cat. #	price
0.4mm	0.25mm and less	10-pk.	24827	
0.5mm	0.32mm	10-pk.	24828	
0.8mm	0.53mm	10-pk.	24829	

also **available**

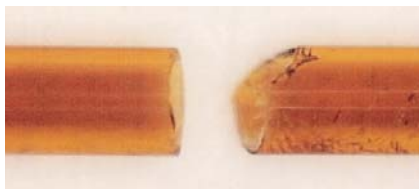
Restek now carries Swagelok fittings in brass & stainless steel.

See **pages 237-239** or visit www.restek.com and search on Swagelok.

Restek Press-Tight® Connectors

Press-Tight® connectors are lightweight, quickly installed, and easy to use. They connect fused silica tubing having outside diameters ranging from 0.33 to 0.74mm (Restek 0.1 to 0.53mm 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 214) 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 201) 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 215) or SeCure™ “Y” Connector (page 216) connector if oven temperatures will exceed 325°C for prolonged periods of time.

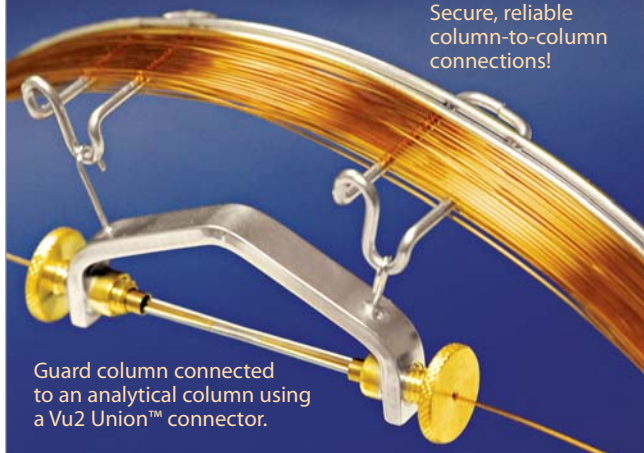
Can Press-Tight® connectors be used with MXT® columns?

No. To achieve a leak-tight fused silica to stainless steel connection, we recommend an MXT™ connector (see page 218).

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 5m, 0.32mm ID guard column connected to a 30m, 0.32mm ID, 1.0µm Rtx®-5 column is cat.# 10254-163.

5m Guard Column	cat.# suffix	Additional Cost*
0.15mm ID	-160	enquire
0.18mm ID	-161	enquire
0.25mm ID	-162	enquire
0.32mm ID	-163	enquire
0.53mm ID	-164	enquire
10m Guard Column	cat.# suffix	Additional Cost*
0.25mm ID	-165	enquire
0.32mm ID	-166	enquire
0.53mm ID	-167	enquire

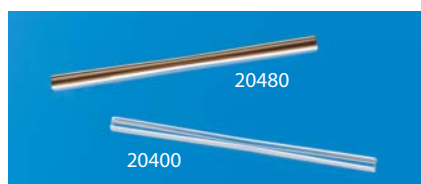
Guard columns listed are intermediate polarity (IP) deactivated.

For more information about guard columns and other deactivations, see pages 29–33.

*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 0.33–0.74mm (Restek 0.1mm–0.53mm ID).
- Made from inert fused silica.



Universal Press-Tight® Connectors

- Connect a guard column to an analytical column.
- Repair a broken column.
- Connect a column outlet to a transfer line.

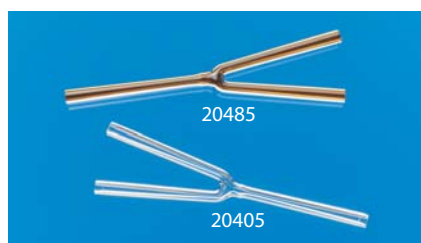
Description	5-pk./price	25-pk./price	100-pk./price
Universal Press-Tight Connectors	20400	20401	20402
Deactivated, Universal Press-Tight Connectors	20429	20430	
Siltek Treated Universal Press-Tight Connectors	20480	20449	



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



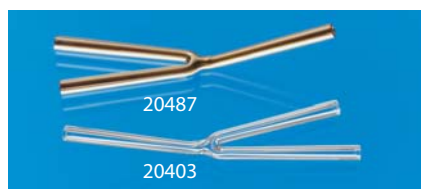
Single injection confirmational analyses!

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
Deactivated Universal “Y” Press-Tight Connector	20405-261	20406-261
Siltek Treated Universal “Y” Press-Tight Connector	20485	20486



Universal Angled “Y” Press-Tight® Connectors

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

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



Polyimide Resin

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

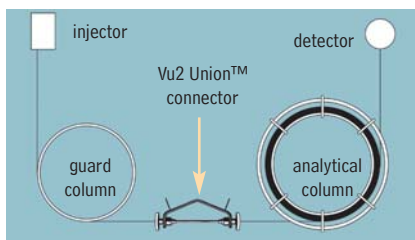
Description	Max. Temp.	qty.	cat.#	price
Polyimide Resin	350°C	5 grams	20445	

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.
- New format will 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.



Updated to fit both Restek cage designs.



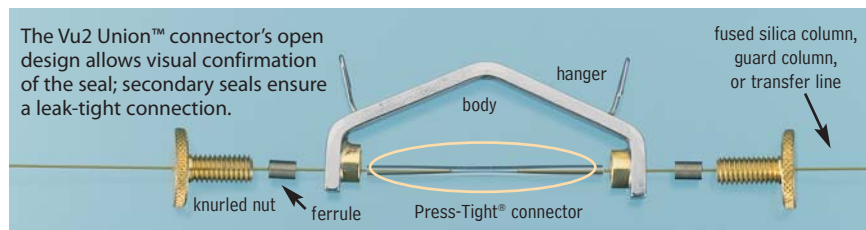
Patent pending.

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.



NOTE: This product is not recommended for GC column-to-MS connections—use the Vacuum Vu-Union (page 217).

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	

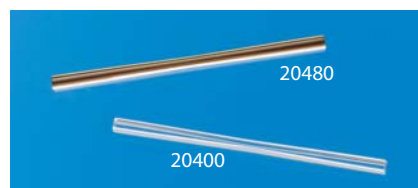
Universal Press-Tight® Connectors

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

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	22222
0.4mm	0.18/0.28mm	20280	20281
0.5mm	0.32mm	20282	20283
0.8mm	0.45/0.53mm	20284	20285



restek
innovation!



Updated to fit both Restek cage designs.



Patent pending.

Secure, reliable
column-to-column
connections!

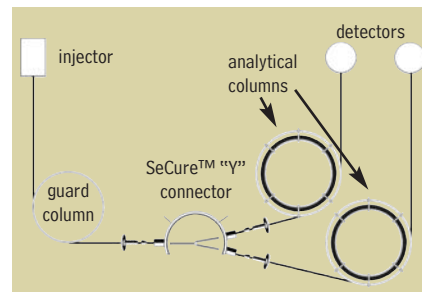
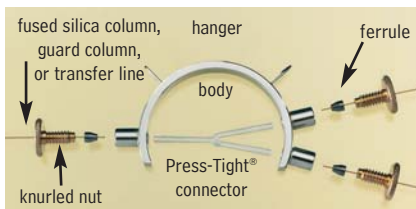
SeCure™ "Y" Connector Kits

- 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.
- New format will 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.

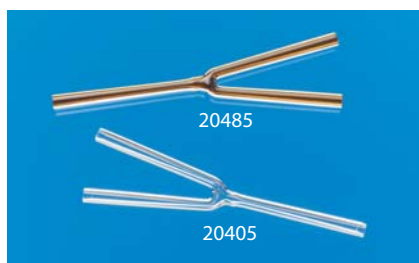


Kits include: SeCure™ "Y" connector body, 3 knurled nuts, "Y" Universal Press-Tight® union, 3 ferrules.

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

- 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 0.33–0.74mm (Restek 0.1mm–0.53mm ID).



Description	ea./price	3-pk./price
Universal "Y" Press-Tight Connector	20405	20406
Deactivated Universal "Y" Press-Tight Connector	20405-261	20406-261
Siltek Treated Universal "Y" Press-Tight Connector	20485	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	0.18/0.25/0.28mm	20200	20227
0.5mm	0.32mm	20201	20228
0.8mm	0.45/0.53mm	20202	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 0.33–0.74mm (Restek 0.1mm–0.53mm 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	



20428

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; for fused silica tubing, use Valcon polyimide adaptor ferrules (see page 218).



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.

Description	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		
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.



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

Valco™ Connectors—One-Piece Valcon Polyimide Adaptor Ferrule for Fused Silica

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.

1/32-Inch Adaptor Ferrule (Valcon Polyimide)

Tubing OD	Tubing ID	Valco #	qty.	cat.#	price
0.25 ≤ 0.40mm	0.25mm	FS.4-5	5-pk.	20137	
0.40 ≤ 0.50mm	0.32mm	FS.5-5	5-pk.	20140	
0.50 ≤ 0.80mm	0.53mm	ZF.5V-5	5-pk.	20141	
1/8" Replacement Nut			5-pk.	20389	

MXT™ Low-Dead-Volume Connector Kits for Metal Columns

These low-dead-volume connectors are Siltek® treated to make them inert to active compounds, just like our MXT® columns. They can be used at temperatures up to 430°C without degrading the deactivated layer. Purchase the appropriate ferrules for connecting 0.28, 0.32 or 0.53mm 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	

1/32-Inch Stainless Steel Replacement Ferrules 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
1/4" NPT Male						
Internal Adapter	1/16" ZDV	1.0mm	PZA21	ea.	20158	
1/4" NPT Male						
Internal Adapter	1/16" ZDV	1.0mm	PZA41	ea.	20159	



Nuts & Ferrules for Valco® Connectors

Description	Valco #	qty.	cat.#	price
1/16" Stainless Steel Ferrules	ZF1-10	10-pk.	20286	
1/16" Stainless Steel Nuts	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 237-241 for our Siltek®/Sulfinert® treated and Silcosteel®-CR treated fittings, as well as many more brass and stainless steel fittings from Swagelok® and Parker.



GC ACCESSORIES GAS PURIFICATION ESSENTIALS

Gas Purification Solutions	221
Gas Purification	222-229
Gas Generators	230-233
Gas Regulators & Accessories	234-236
Tube & Pipe Fittings	237-241
Tubing & Valves	242-246
Leak Detector	246
Installation Tools	247
Tubing & Fitting Tools	248-249



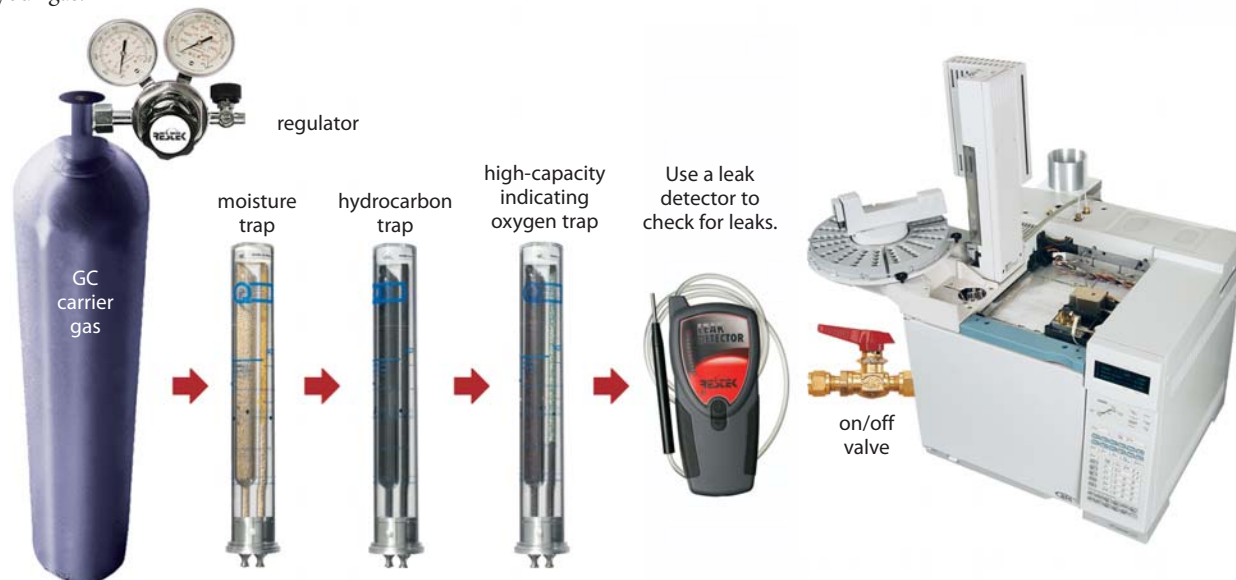
Top: Deb Weaver, Shipping Technician
Bottom: Joe Eckley, Supplier Quality Technician



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 or 814-353-1300, ext. 4, 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 1ppm 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. 225).

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. 225).

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. 225) 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 <1ppm oxygen. This can be monitored by continually leak checking all gas system connections using Restek's Electronic Leak Detector (cat.# 22839, page 222).

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.

Gas Management System, Leak Detector

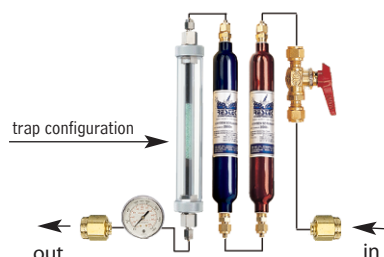
Restek Gas Management System

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.

- Removes moisture, hydrocarbons, and oxygen from carrier gas, extending column lifetime.
- Produces high-purity carrier gas for most applications.
- Includes one each: moisture, hydrocarbon, and indicating oxygen trap.
- Replacing traps is safe and easy.
- Maximum flow: 1 liter/minute.



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



did you know?

The Restek Gas Management System removes water vapor (to 10ppb), hydrocarbons (to 0.1ppm), and oxygen (to less than 0.1ppm) with three traps housed in one unit.

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



22839

CE

Restek Electronic Leak Detector

Why have a small leak turn into a costly repair? Protect your data 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.

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, 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 X 10 ⁻⁵	Red
Hydrogen*	1.0 X 10 ⁻⁵	Red
Nitrogen	1.4 X 10 ⁻³	Yellow
Argon	1.0 X 10 ⁻⁴	Yellow
Carbon Dioxide	1.0 X 10 ⁻⁴	Yellow

Description	qty.	cat.#	price
Leak Detector with Universal Charger Set (US, UK, European, Australian)	ea.	22839	
Soft-Side Carry/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.



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

22658



Dimensions: 9¹/₄" 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, 100psi (689kPa) operating pressure.
- Built-in frit traps microparticles.
- Outlet gas purity:
 - O₂ < 0.1ppm when inlet does not exceed 15ppm.
 - H₂O < 0.5ppm when inlet does not exceed 10ppm.
- Maximum operating pressure: 150psi (1,034kPa).
- Maximum flow: 16.5L/min.

Description	qty.	cat.#	price
High-Capacity Indicating Oxygen Trap, 1/8" Compression Tube Brass Fittings	ea.	20624	
High-Capacity Indicating Oxygen Trap, 1/4" Compression Tube Brass Fittings	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 1¹/₄" (25.4 x 3.2 cm)

Indicating Oxygen Trap

- Indicator changes from light green to grey as oxygen is trapped.
- Heavy-walled glass body prevents oxygen & water infusion.
- Prepurged for fast stabilization.
- 100psi (689kPa) maximum operating pressure.
- Reduces oxygen to 0.1ppm.

Description	qty.	cat.#	price
Indicating Oxygen Trap, 1/8" Nickel-Plated Brass Fittings	ea.	22010	
Indicating Oxygen Trap, 1/4" Nickel-Plated Brass Fittings	ea.	22011	



Dimensions: 11" x 1¹/₂" (27.9 x 3.8 cm)

High-Capacity Oxygen Trap

- Removes up to 600mg of oxygen or 2g of water.
- Long life—typically purifies more than five 200ft³ cylinders.
- Reduces oxygen to 15ppb.
- Maximum operating pressure: 250psi (1,724kPa).
- Flow: 3L/min. @ 32psi (221kPa).

Description	qty.	cat.#	price
High-Capacity Oxygen Trap, 1/8" Nickel-Plated Brass Fittings	ea.	20601	
High-Capacity Oxygen Trap, 1/4" Nickel-Plated Brass Fittings	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 1ppm.
- Fits in GC oven for easy thermal recharging.
- Maximum flow: 1L/min.



Dimensions: 6³/₄" x 5⁵/₈"
(17.1 x 14.3 cm)

Description	qty.	cat.#	price
Rechargeable Molecular Sieve S-Trap, 1/8" Brass Fittings	ea.	20686	
Rechargeable Molecular Sieve S-Trap, 1/4" Brass Fittings	ea.	20685	



Dimensions: 11" x 1¹/₂" (27.9 x 3.8 cm)

High-Capacity Moisture Trap

- Purged with ultra-high-purity helium; ready to use.
- Reduces water to less than 15ppb.
- Maximum operating pressure: 250psi (1,724kPa).
- Maximum flow: 1.25L/min.

Description	qty.	cat.#	price
High-Capacity Moisture Trap, 1/8" Nickel-Plated Brass Fittings	ea.	21997	
High-Capacity Moisture Trap, 1/4" Nickel-Plated Brass Fittings	ea.	20638	



Dimensions: 13" x 2" (33 x 5.1 cm)

Indicating Moisture Trap

- Reduces water to less than 10ppb; indicator changes from blue to pink at 5% relative humidity.
- Prepurged for fast stabilization.
- Reduces noise from high-sensitivity detectors.
- Heavy-walled glass body prevents oxygen & water infusion.
- 40µm frit prevents microparticulate damage to needle valves and flow controllers.
- Maximum operating pressure: 100psi (689kPa).

Description	qty.	cat.#	price
Indicating Moisture Trap, 1/8" Nickel-Plated Brass Fittings	ea.	22014	
Indicating Moisture Trap, 1/4" Nickel-Plated Brass Fittings	ea.	22015	



Dimensions: 11" x 1½" (27.9 x 3.8 cm)

Capillary-Grade Hydrocarbon Trap

- Packed with an extremely high surface area, baked coconut shell-based activated carbon.
- Purged with ultra-high purity helium.
- Reduces organics to 0.1ppm (assuming 100ppm input).
- Maximum operating pressure: 250psi (1,724kPa).

Description	qty.	cat.#	price
Capillary-Grade Hydrocarbon Trap, ⅜" Nickel-Plated Brass Fittings	ea.	21991	
Capillary-Grade Hydrocarbon Trap, ¼" Nickel-Plated Brass Fittings	ea.	21992	



Dimensions: 9¼" x 2¼" (23.5 x 5.7 cm)

Refillable Hydrocarbon Trap

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

Description	qty.	cat.#	price
Refillable Hydrocarbon Trap, ⅜" Nickel-Plated Brass Fittings	ea.	22012	
Refillable Hydrocarbon Trap, ¼" Nickel-Plated Brass Fittings	ea.	22013	
Carbon Refill (two recharges)	pint	20626	

Hydrocarbon S-Trap

- Removes hydrocarbons and other contaminants.
- Reduces organics to 0.1ppm (assuming 100ppm input).
- Each individually activated to ensure maximum efficiency.
- Fits in GC oven for easy thermal recharging.
- Maximum operating pressure: 60psi (414kPa).



Dimensions: 6¾" x 5⅝"
(17.1 x 14.3 cm)

Description	qty.	cat.#	price
Hydrocarbon S-Trap, ⅜" Brass Fittings	ea.	22016	



Dimensions: 6" x 1¾" (15.2 x 4.4 cm)

Indicating Hydrocarbon Trap for Air Compressors

- Pass compressed air from an oil-filled air compressor through this trap, to remove oil vapors and mist.
- Indicator changes from pale pink to deep pink.

Description	qty.	cat.#	price
Indicating Hydrocarbon Trap for Air Compressors, ⅜" Brass Fittings	ea.	20637	
Indicating Hydrocarbon Trap for Air Compressors, ¼" Brass Fittings	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.
- Lasts approximately one month or 1,500 injections.
- Includes connecting lines and mounting kit.

Description	qty.	cat.#	price
High-Capacity Split Vent Trap, ⅜" Fittings	ea.	20698	
High-Capacity Split Vent Trap, ¼" Fittings	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	qty.	cat.#	price
ECD Vent Trap, ⅜" Fittings	ea.	22017	



Carrier Gas Purity

Carrier gas should contain less than 1ppm 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

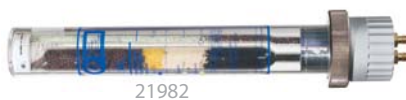
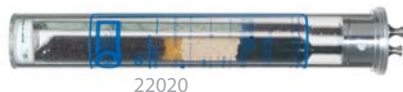
- High-purity output ensures 99.9999% pure gas (at max. flow of 2L/min.).
- “Quick connect” fittings for easy, leak-tight cartridge changes.
- Glass inside to prevent diffusion; polycarbonate housing outside for safety.
- All traps measure 10⁵/₈" x 1³/₄" (27 x 4.4 cm).
- Each base plate unit measures 4" x 4" x 1⁷/₈" (10.2 x 10.2 x 4.8 cm).

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

Type of Filter	Outlet Gas Quality (%)	Maximum Pressure/ Maximum Flow Rates	Use for:	Indicator Color Change	Capacity			Estimated Lifetime (years)
					H ₂ O (g)	O ₂ (mL)	Hydrocarbons (g)	
Moisture cat.# 22028	> 99.9999	11 bar 159psi/ 7 L/min.	Inert carrier gas Air Hydrogen	Yellow/orange to clear	7.2	—	—	> 2
Oxygen cat.# 22029	> 99.9999	11 bar 159psi/ 7 L/min.	Inert carrier gas	Green to grey	NA	1,000	—	> 2
Hydrocarbons cat.# 22030	> 99.9999	11 bar 159psi/ 7L/min.	Inert carrier gas Air Hydrogen	No indicator	NA	—	12 ¹	> 2
Fuel Gas ¹ cat.# 22022	> 99.9999	11 bar 159psi/ 7L/min.	Inert carrier gas Air Hydrogen	Yellow/orange to clear	3.5	—	24 ³	> 1.5
Triple ² cat.# 22020	> 99.9999	11 bar 159psi/ 7L/min.	Inert carrier gas	Yellow/orange to clear Green to grey	1.8	500	4 ³	> 1
Helium Specific ² cat.# 21982	> 99.9999	11 bar 159psi/ 7L/min.	Helium	Yellow/orange to clear Green to grey	1.8	500	—	> 1

¹Removes hydrocarbons, moisture.²Removes hydrocarbons, moisture, oxygen.³As *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	enquire
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	

**tech tip****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.



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.
- Base plates fit all Super-Clean gas filters listed on previous page.

Description	qty.	Brass		Stainless Steel	
		cat.#	price	cat.#	price
Single-Position Filter Base Plate	ea.	22025		ea. 22344	
2-Position Filter Base Plate	ea.	22026		ea. 22345	
3-Position Filter Base Plate	ea.	22027		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.



Description	qty.	Brass		Stainless Steel	
		cat.#	price	cat.#	price
1/8" to 1/4" Tube-End Unions	5-pk.	21833		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 20L of hydrocarbon-free nitrogen per minute.
- Filters connected in parallel to handle high flows of LC/MS.



20L of purified nitrogen per minute!

Super-Clean Gas Filters provide high-purity outlet gas

Type of filter:	Hydrocarbon (charcoal)
Max. Flow:	20L/min.
Outlet Gas Quality %:	99.9999%
Maximum Pressure:	11 bar/159psi
Estimated Lifetime:	3 to 6 months

Super-Clean Gas Trapping System for LC/MS

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 233.



Catch the Buzz

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

Restek Click-On Inline Super-Clean Purification Gas Traps

- High-purity output ensures 99.9999% pure gas.
- Click-On fittings for easy, leak-tight cartridge changes; brass or stainless steel, $\frac{1}{4}$ " 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 ₂ O (g)	Capacity O ₂ (mL)	Hydrocarbons (g) (n-butane)	Estimated Lifetime (years)
Moisture cat.#22467	>99.9999	11 bar 160psi	25	Inert carrier gas, helium, air, H ₂	15	NA	NA	>3
Oxygen cat.#22468	>99.9999	11 bar 160psi	25	Inert carrier gas	NA	2,000	NA	>3
Hydrocarbon cat.#22466	>99.9999	11 bar 160psi	25	Inert carrier gas, helium, air, H ₂	NA	NA	24	>3
Fuel Gas ¹ cat.#22465	>99.9999	11 bar 160psi	25	Inert carrier gas, helium, air, H ₂	7	NA	12	>2
Triple ² cat.#22464	>99.9999	11 bar 160psi	25	Inert carrier gas	4	1,000	8	>2

¹Removes hydrocarbons, moisture.

²Removes 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 3.2cm)



did you know?

Trap replacement depends on the quality of the incoming gas. Use the double connector and install an indicating cartridge after a trap to indicate when the trap should be replaced.

Restek Click-On Inline Super-Clean Gas Traps and Connector Kits

Description	qty.	cat.#	price
Carrier Gas Purification Kit, $\frac{1}{8}$ " Stainless Steel Includes (2) $\frac{1}{8}$ " SS connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22456	
Carrier Gas Purification Kit, $\frac{1}{8}$ " Brass Includes (2) $\frac{1}{8}$ " brass connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22457	
Carrier Gas Purification Kit, $\frac{1}{4}$ " Stainless Steel Includes (2) $\frac{1}{4}$ " SS connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22458	
Carrier Gas Purification Kit, $\frac{1}{4}$ " Brass Includes (2) $\frac{1}{4}$ " brass connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22459	
Fuel Gas Purification Kit, $\frac{1}{8}$ " Stainless Steel Includes (4) $\frac{1}{8}$ " SS connectors and (2) hydrocarbon/moisture traps	kit	22460	
Fuel Gas Purification Kit, $\frac{1}{8}$ " Brass Includes (4) $\frac{1}{8}$ " brass connectors and (2) hydrocarbon/moisture traps	kit	22461	
Fuel Gas Purification Kit, $\frac{1}{4}$ " Stainless Steel Includes (4) $\frac{1}{4}$ " SS connectors and (2) hydrocarbon/moisture traps	kit	22462	
Fuel Gas Purification Kit, $\frac{1}{4}$ " Brass Includes (4) $\frac{1}{4}$ " brass connectors and (2) hydrocarbon/moisture traps	kit	22463	





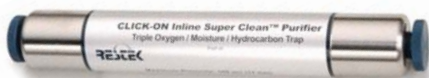
Click-On Inline Super-Clean Indicator

- Oxygen: Green to Grey
- Moisture: Beige to Clear

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

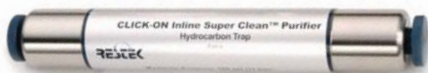


Install an indicator after the Click-On inline gas filter so there is no confusion about when to replace the traps.



Click-On Inline Super-Clean Replacement Gas Traps

Description	qty.	cat.#	price
Click-On Super-Clean Replacement Triple Trap (removes oxygen, moisture and hydrocarbons)	ea.	22464	
Click-On Super-Clean Replacement Fuel Gas Trap (removes moisture and hydrocarbons)	ea.	22465	

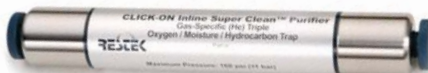


Click-On Inline Super-Clean Ultra-High Capacity Gas Traps

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	

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.



Helium-Specific Click-On Inline Super-Clean Gas Trap and Connector Kits

Description	qty.	cat.#	price
Kits			
Helium-Specific Carrier Gas Cleaning Kit, 1/8" Stainless Steel Includes (2) 1/8" SS connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap	kit	22469	
Helium-Specific Carrier Gas Cleaning Kit, 1/8" Brass Includes (2) 1/8" brass connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap	kit	22470	
Helium-Specific Carrier Gas Cleaning Kit, 1/4" Stainless Steel Includes (2) 1/4" SS connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap	kit	22471	
Helium-Specific Carrier Gas Cleaning Kit, 1/4" Brass Includes (2) 1/4" brass connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap	kit	22472	
Replacement Trap			
Helium-Specific Replacement Triple Trap (removes oxygen, moisture and hydrocarbons)	ea.	22473	



Each connector is 2 3/8" (6cm) in length.

Click-On Inline Super-Clean Connectors

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

Description	qty.	cat.#	price
1/8" Brass Click-On Inline Super-Clean Connectors	2-pk.	22475	
1/8" Stainless Steel Click-On Inline Super-Clean Connectors	2-pk.	22476	
1/4" Brass Click-On Inline Super-Clean Connectors	2-pk.	22477	
1/4" Stainless Steel Click-On Inline Super-Clean Connectors	2-pk.	22478	



Each double connector is 3" (8cm) in length.

Click-On Inline Super-Clean Double Connector

- Connects any Click-On trap to a Click-On indicator.

Description	qty.	cat.#	price
Click-On Inline Super-Clean Double Connector, Stainless Steel	ea.	22479	



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	

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% (50ppm) 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.

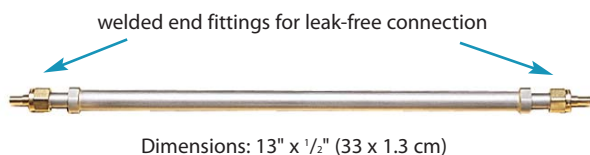
Specifications:

Length	21" (52.3cm)
Diameter	1.5" (3.8cm)
Maximum Inlet Pressure	1,000psi (6895kPa)
Maximum Recommended Flow	500mL/min.
Pressure Drop from 120psi (827 kPa) inlet at at 0-500mL/min.:	<0.20psi (1.4kPa)
End Fittings	compression, 1/8" or 1/4", stainless steel
Shipping Weight	3.04 lb. (1,300 g)

Gas-Specific Purifier Module

Air Purifier Module			Air Purifier Module			
	qty.	cat.#	price	qty.	cat.#	price
Helium Purifier Module	ea.	22600		ea.	22601	
Hydrogen Purifier Module	ea.	22602		ea.	22603	
Nitrogen Purifier Module*	ea.	22604		ea.	22605	
Air Purifier Module	ea.	22606		ea.	22607	

*Warning: Do not use with nitrogen containing more than 500ppm of oxygen. If the oxygen level in the stream exceeds 500ppm, 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 12L oxygen and 35L 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.

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.

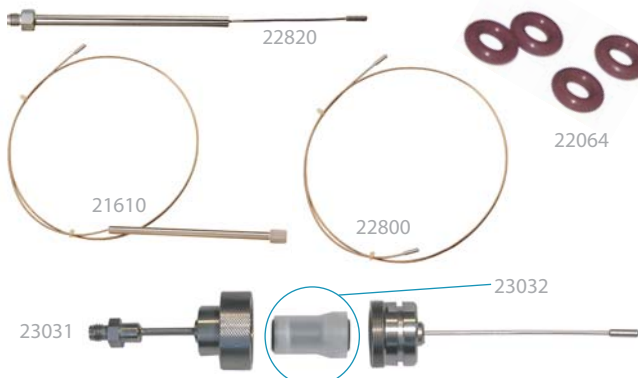
Change tube when gas pressure drops.

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 (0-689kPa) gauge.



Description	qty.	cat.#	price
In-line Gas Pressure Gauge Kit for Thermal Gas Purifiers	kit	21657	



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 for Agilent GCs (32-inch) (Includes all installation hardware.)	19251-80525			
	G1544-20620	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 510cc/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:	10-100psig \pm 1psig (69-689kPa \pm 7kPa)
Outlet Port:	1/8" compression
Electrical Requirements:	100-230VAC/50-60Hz
Physical Dimensions:	17.12"h x 13.46"w x 17.95"d (43.48 x 34.19 x 45.6cm)
Shipping Weight:	40 lbs. (18kg) dry



free
literature

Parker Balston®
Hydrogen Generators

Download your free copy
from www.restek.com.

Fast Facts
lit. cat. # 580053A

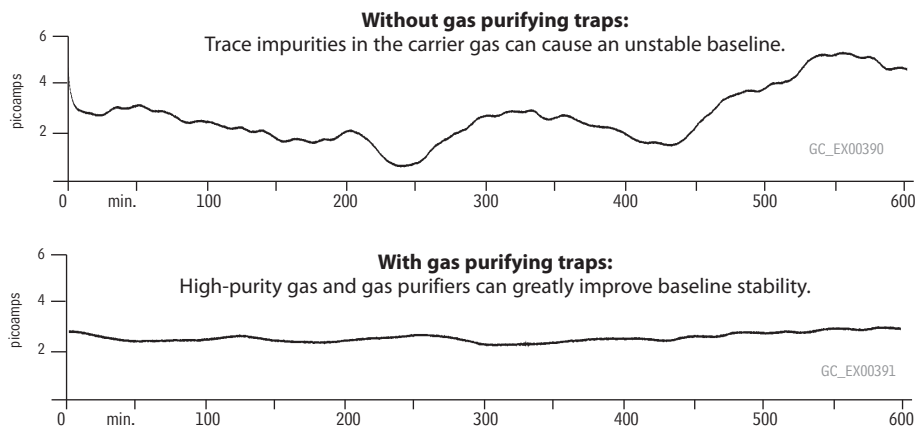
Description

Description	Capacity	qty.	cat. #	price
Hydrogen Generator H2PEM-100	100cc/min.	ea.	23065	enquire
Hydrogen Generator H2PEM-165	165cc/min.	ea.	23066	enquire
Hydrogen Generator H2PEM-260	260cc/min.	ea.	23067	enquire
Hydrogen Generator H2PEM-510	510cc/min.	ea.	23068	enquire

Replacement and Maintenance Components for Hydrogen Generators (for all models listed above)

Replacement Desiccant Cartridge for H2PEM Generators	ea.	23069	enquire
6-Month Maintenance Kit for H2PEM Generators (Includes: 1 deionizer cartridge, 1 water filter, 3 environmental filters)	kit	23070	enquire
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	enquire

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



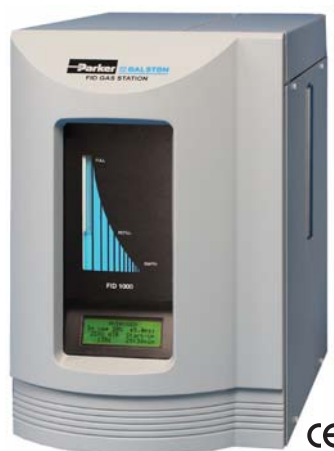
Using purifying gas traps
in combination with a
gas generator can
improve chromatography
tremendously and
improve column lifetime.

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 0.1ppm 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:	120VAC/amp, 60Hz, 400 watts
Zero Air Purity:	FID-1000: < 0.1ppm total hydrocarbons as methane	Hydrogen Outlet Pressure:	60 psig (414kPa)
	FID-2500: < 0.05ppm total hydrocarbons as methane	Zero Air Outlet Pressure:	40-125 psig* (276-862kPa)
Max. Hydrogen Flow Rate:	FID-1000: 90cc/min.	Inlet Connection:	1/4" NPT (female)
	FID-2500: 250cc/min.	Outlet:	1/8" compression
Max. Zero Air Flow Rate:	FID-1000: 1000cc/min.	Dimensions:	16.5"h x 10.5"w x 17"d (42cm x 27cm x 43cm)
	FID-2500: 2500cc/min.	Weight:	53 lbs. (24kg)

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



free literature

FID Gas Stations

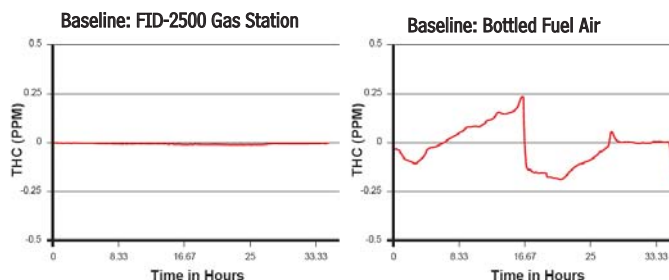
Download your free copy
from www.restek.com.

Fast Facts
lit. cat.# 580051

ordering note

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

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	qty.	cat. #	price
Model FID-1000 Gas Station (ideal for 1-2 FIDs)	ea.	20177	enquire
Model FID-2500 Gas Station (ideal for 5-6 FIDs)	ea.	24913	enquire
Replacement Components for FID Gas Stations			
Resin Bed Cartridge for Hydrogen Generators in FID-1000 and FID-2500 Gas Stations	ea.	24914	enquire
Replacement Desiccant Cartridge	ea.	21671	enquire
FID Gas Station Maintenance Kit (Includes 1 desiccant cartridge, 1 resin bed cartridge, 1 filter cartridge)	ea.	24915	enquire

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	N/C
European (230VAC, 50/60Hz)	ea.	-551	N/C
IEC Connector Only (230VAC, 50/60Hz)	ea.	-552	N/C
Japanese (200VAC, 50/60Hz)	ea.	-556	N/C
Japanese for Zero Air (100VAC, 50/60Hz)	ea.	-553	enquire
Japanese for Hydrogen (100VAC, 50/60Hz)	ea.	-554	enquire
Japanese for Nitrogen (100VAC, 50/60Hz)	ea.	-555	enquire

Select the power
cord you need.



Parker Balston® Zero Air Generators

- Turn in-house compressed air into ultra-pure air (<0.1ppm total hydrocarbons).
- Remove hydrocarbons to less than 0.1ppm by catalytic oxidation.
- Operate at 40 to 125psi (276-862kPa).
- 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 (276/862kPa)	
Maximum Inlet Hydrocarbon Concentration (as methane):	100 ppm	
Pressure Drop at Maximum Flow Rate:	4 psi (28kPa) 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 (30cm x 25cm x 8cm)
	Other Models	16"h x 11"w x 13"d (42cm x 27cm x 34cm)
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	Capacity	qty.	cat. #	price
Zero Air Generator Model 75-83NA	1000cc/min.	ea.	20684	enquire
Zero Air Generator Model 75-83NA with United Kingdom Power Cord	1000cc/min.	ea.	20684-550	enquire
Zero Air Generator Model HPZA-3500	3500cc/min.	ea.	20680	enquire
Zero Air Generator Model HPZA-3500 with European Power Cord	3500cc/min.	ea.	20680-551	enquire
Zero Air Generator Model HPZA-7000	7000cc/min.	ea.	20681	enquire
Zero Air Generator Model HPZA-18000	18,000cc/min.	ea.	20682	enquire
Zero Air Generator Model HPZA-30000	30,000cc/min.	ea.	20683	enquire

Maintenance Kits (includes a one-year supply of prefilters and final filter)

	qty.	cat. #	price
Maintenance Kit for Model 75-83NA	kit	21646	enquire
Maintenance Kit for Models HPZA-3500, HPZA-7000, HPZA-18000, HPZA-30000	kit	21647	enquire

Replacement Catalyst Towers

	Capacity	qty.	cat. #	price
Replacement Catalyst Tower for Model 75-83NA	1000cc/min.	ea.	22005	enquire
Replacement Catalyst Tower for Model HPZA-3500	3500cc/min.	ea.	22004	enquire
Replacement Catalyst Tower for Model HPZA-7000	7000cc/min.	ea.	22006	enquire
Replacement Catalyst Tower for Model HPZA-18000	18,000cc/min.	ea.	22007	enquire
Replacement Catalyst Tower for Model HPZA-30000	30,000cc/min.	ea.	22008	enquire

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	N/C
European (230VAC, 50/60Hz)	ea.	-551	N/C
IEC Connector Only (230VAC, 50/60Hz)	ea.	-552	N/C
Japanese (200VAC, 50/60Hz)	ea.	-556	N/C
Japanese for Zero Air (100VAC, 50/60Hz)	ea.	-553	enquire
Japanese for Hydrogen (100VAC, 50/60Hz)	ea.	-554	enquire
Japanese for Nitrogen (100VAC, 50/60Hz)	ea.	-555	enquire



free literature

Zero Air Generators

Download your free copy from www.restek.com.

Fast Facts

lit. cat. # 580050

Parker Balston® Nitrogen Gas Generators

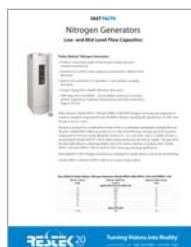
- Turn compressed air into ultra-pure nitrogen (up to 99.9995%).
- Flows from 1 to 75+ Lpm.
- Require only a compressed air source and 110 volt AC power.
- Safe, reliable, low maintenance.
- Maintenance kits include replacement filters.
- N2-14 and N2-14A can be used for LC/MS.

Specifications

	Model HPN2-1100 or UHPN2-1100	Model HPN2-2000	Model N2-14 or N2-14A
Maximum Nitrogen Flow Rate:	See Flow Table	2 lpm	78scfh** at 95% purity
Nitrogen Purity:	99.9999%	99.99%	95.0%–99.5%
Maximum Nitrogen Outlet Pressure:	See Flow Table	90 psig	
CO Concentration:	< 1.0 ppm	NA	
CO ₂ Concentration:	< 1 ppm	< 1 ppm	
O ₂ Concentration:	< 1 ppm	< 100 ppm	
H ₂ O Concentration:	≤ 2 ppm	≤ 2 ppm	
Hydrocarbon Concentration ¹ :	< 0.1 ppm	NA	
Argon Concentration ² :	0.9%	0.9%	
Atmospheric Dewpoint:			-58°F (-50°C)
Suspended Liquids:			None
Particles > 0.01μm:			None
Oxygen Analyzer:			Included with Model 75-720NA
Commercially Sterile:			Yes
Minimum/Maximum Inlet Pressure:	60 psig/125 psig (414/862kPa)	75 psig/120 psig (517/827kPa)	60 psig/145 psig (414/1,000kPa)
Maximum Pressure Drop (99% N ₂ Purity, 125 psig):			10 psig (69kPa)
Recommended Inlet Temperature:	≤ 78°F (25°C)	≤ 78°F (25°C)	≤ 68°F (25°C) (Max.)
Ambient Operating Temperature:	60°F–100°F (16°C–38°C)	40°F–100°F (4°C–38°C)	110°F (43°C) (Max.)
Maximum Air Consumption:	42 lpm (1.5 scfm)*	42 lpm (1.5 scfm)*	
Inlet Connection:	1/4" NPT (female)	1/4" NPT (female)	1/4" NPT
Outlet Connection:	1/4" compression	1/8" NPT compression	1/8" NPT
Electrical Requirements ³ :	120 VAC/60 Hz	120 VAC/60 Hz	N2-14: None N2-14A: 120 VAC/60 Hz/25 Watts
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)	50"h x 16"w x 16"d (127cm x 41cm x 41cm)
Shipping Weight:	115 lbs. (52 kg)	115 lbs. (52 kg)	N2-14: 75 lbs. (34 kg) N2-14A: 80 lbs. (36 kg)

Flow Table for Models HPN2-2000, HPN2-1100, and UHPN2-1100

Inlet Air Pressure	Maximum Outlet Flow (cc/min.)	Maximum
	Models HPN2-1100 and UHPN2-1100	Outlet Pressure
125 psig (862kPa)	1100	85 psig (586kPa)
110 psig (758kPa)	1000	75 psig (517kPa)
100 psig (689kPa)	900	65 psig (448kPa)
90 psig (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.

Fast Facts
lit. cat. # 580052



20677

¹Models HPN2-1100 and HPN2-2000 do not remove hydrocarbons.

²Purity specification for nitrogen does not include argon concentration.

³Power consumption is:
Model HPN2-1100 = 25 Watts
Model UHPN2-1100 = 700 Watts
Model HPN2-2000 = 25 Watts

Parker Balston® Nitrogen Generators for LC/MS or General Purposes**Nitrogen Generators for LC/MS or General Purpose**

	qty.	cat. #	price
Nitrogen Generator N2-14 (general purpose) 78 scfh** max. flow at 95% purity	ea.	20677	enquire
Nitrogen Generator N2-14 with European Power Cord	ea.	20677-551	enquire
Nitrogen Generator N2-14A (general purpose w/oxygen analyzer) 78 scfh** max. flow at 95% purity	ea.	21652	enquire

Nitrogen Generators

	qty.	cat. #	price
Nitrogen Generator HPN2-2000 (high purity—99.99%) 2.0 lpm max. flow	ea.	21654	enquire
Nitrogen Generator HPN2-1100 (ultra-high purity—99.9995%) 1.1 lpm max. flow	ea.	21653	enquire
Nitrogen Generator UHPN2-1100 (ultra-high purity—99.9995%); [HC<0.1ppm] 1.1 lpm max. flow	ea.	20697	enquire

Maintenance Kits

	qty.	cat. #	price
Maintenance Kit for Models N2-14, N2-14A, 75-72, 75-720NA	kit	21648	enquire
Maintenance Kit for Models HPN2-1100, HPN2-2000, 76-96, 76-92	kit	21649	enquire
Maintenance Kit for Models UHPN2-1100, 76-94	kit	21655	enquire

*Standard cubic feet per minute.

**Standard cubic feet per hour

**ordering
note**

For international orders, please add the appropriate power cord suffix from the table on the previous page.

Overview of Restek's Ultra-High Purity (UHP) Gas Regulators

- Regulators feature metal-to-metal seals throughout for long-term leak-tightness.
- Metal diaphragm outlet valve ensures gas purity.
- Each regulator is helium leak-test-certifiable to 1×10^{-8} scc/sec.
- Temperature range: -40°C to 60°C

Ultra-High Purity (UHP) Brass Body Gas Regulators

UHP brass regulators are the best choice when using ultra-high purity carrier gas for sensitive GC applications using MS, PID, or ECD detection methods. They feature reduced internal dead-volume, relative to stainless steel bodies. The metal valve diaphragm ensures leak-free shut-off. Oxidation-resistant chrome plating maintains a like-new appearance.



Dual-Stage Ultra-High Purity Chrome-Plated Brass Gas Regulators

- Oxidation-resistant, chrome-plated.
- Most stable outlet pressure control.
- Secondary pressure regulation not needed.
- Most widely used regulator.
- Less internal volume than stainless steel gas regulators.

Inlet gauge: 0 to 4,000psig (0-27,579kPa)
Outlet assembly: diaphragm valve, $\frac{1}{4}$ " tube fitting

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
CGA 580 (N ₂ , He, Ar)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	21667	
CGA 350 (H ₂ , P ₂)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	21668	
CGA 590 (Air)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	21669	



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, $\frac{1}{4}$ " tube fitting

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
CGA 580 (N ₂ , He, Ar)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	20646	
CGA 350 (H ₂ , P ₂)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	20647	
CGA 590 (Air)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	20648	



Ultra-High Purity Chrome-Plated Brass Line Gas Regulator

- Oxidation-resistant, chrome-plated.
- Use where you need to reduce the line pressure by 20psig (138kPa) or more.
- Same purity protection as high-pressure cylinder regulators.

Inlet connections: $\frac{1}{4}$ " FPT
Outlet assembly: $\frac{1}{4}$ " FPT port

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
$\frac{1}{4}$ " female NPT ports*	0-50psig (0-345kPa)	30" - 0 to 100psig (0-689kPa)	ea.	21666	
$\frac{1}{4}$ " 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



23134

23179

Fitting Type	Size (inches)	Similar to Swagelok	Brass	Stainless Steel
Male Connector	$\frac{1}{4}$ " to $\frac{1}{4}$ " NPT	400-1-4	10-pk. 23134	2-pk. 23184
Male Connector	$\frac{1}{8}$ " to $\frac{1}{4}$ " NPT	200-1-4	10-pk. 23136	2-pk. 23186
Tube End Reducer	$\frac{1}{4}$ " tube to $\frac{1}{8}$ "	200-R-4	5-pk. 23129	2-pk. 23179

Ultra-High Purity (UHP) Stainless Steel Body Gas Regulators

UHP stainless steel regulators are the standard for ultra-high-purity and corrosion-resistant pressure regulation. They are more easily purged of atmospheric components, compared to brass gas regulators, making them ideal for the most demanding applications. Stainless steel is especially useful in atmospheres of dry corrosive gases such as hydrogen.

Dual-Stage Ultra-High Purity Stainless Steel Gas Regulators

- Most stable outlet pressure control.
- Secondary pressure regulation not needed.

Inlet gauge: 0 to 4,000psig (0-27,579kPa)
 Outlet assembly: diaphragm valve, 1/4" tube fitting

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
CGA 580 (N ₂ , He, Ar)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20662	
CGA 350 (H ₂ , P ₂)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20663	
CGA 590 (Air)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20664	

**Single-Stage Ultra-High Purity Stainless Steel Gas Regulators**

- Use when there is secondary pressure requirement 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 ₂ , He, Ar)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20665	
CGA 350 (H ₂ , P ₂)	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	qty.	cat.#	price
Flexible Stainless Steel Hose, 36", 1/4" Female NPT Fittings	ea.	21339	
Flexible Stainless Steel Hose, 18", 1/4" Female NPT Fittings	ea.	21340	
Flexible Stainless Steel Hose, 36", with 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 ₂ , He, Ar)	ea.	21336	
CGA 350 Fitting, (H ₂ , P ₂)	ea.	21337	
CGA 590 Fitting, (Air)	ea.	21338	



21336

ordering note**International Fittings**

All gas regulators are available with the following BS (British Standard) and DIN (German Industrial Standards Organization) connections. Please contact your local Restek representative for more information.

BS 341 #01	BS 341 #08	BS 341 #15	DIN 477 #06	DIN 477 #10	DIN 477 #14
BS 341 #02	BS 341 #10	DIN 477 #01	DIN 477 #07	DIN 477 #11	DIN 477 #15
BS 341 #03	BS 341 #13	DIN 477 #03	DIN 477 #08	DIN 477 #12	
BS 341 #04	BS 341 #14	DIN 477 #05	DIN 477 #09	DIN 477 #13	

Critical Purity Automatic Switchover System for Noncorrosive Gases

High-purity automatic switchover systems provide a continuous supply of high purity gas to the laboratory, process, or instrument, to allow you to replace a depleted gas source without interruption in the gas supply. Continuous gas supply is achieved by setting the two regulators at slightly different pressures and discharging one side of the system at a time. These models include flexible, all-stainless-steel pigtailed with armor casing. The CGA connection on each pigtail has a check valve in the gland to prevent contamination and minimize purging requirements.



Switching pressure:	200psig/170psig (1379/1172kPa)
Inlet connections:	flexible SS pigtailed (36")
Line regulator:	0 to 100psig (0-689kPa)

Brass Automatic Switchover System with Line Regulator

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

Stainless Steel Automatic Switchover System with Line Regulator

	qty.	cat.#	price
CGA 580 (N ₂ , 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 ₂ , He, Ar)	ea.	21347	
CGA 350 (H ₂ , P ₂)	ea.	21348	
CGA 590 (Air)	ea.	21349	
Stainless Steel Protocol Station*	qty.	cat.#	price
CGA 580 (N ₂ , He, Ar)	ea.	21327	

*Pressure regulator not included. Order separately.



Cylinder Valve Wrench

This specially-designed wrench enables easy opening of cylinder valves that are fitted with a hand wheel. It is also suitable for removing difficult cylinder caps.

Description	qty.	cat.#	price
Cylinder Valve Wrench	ea.	21321	



Universal Cylinder Wrench

Use this versatile wrench for tightening gauges and gas regulator CGA fittings to cylinder outlets and pipe thread connections.

Description	qty.	cat.#	price
Universal Cylinder Wrench	ea.	21322	



Backpressure Gas Regulator

Capillary GC inlet systems have backpressure regulators to maintain a constant upstream pressure and rapidly respond to catastrophic leaks. The 0–60psig (0–414kPa) operating range is sufficient to operate a 105m, 0.25mm 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 0–60psig (0–414kPa) gauge and either 1/8- or 1/4-inch tube fittings.



Description	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	qty.	cat.#	price
Single Cylinder Holder, Wall Mounted	ea.	21333	
Double Cylinder Holder, Wall Mounted	ea.	23400	
Triple Cylinder Holder, Wall Mounted	ea.	23401	
Four Cylinder Holder, Wall Mounted	ea.	23402	

Swagelok® Brass & Stainless Steel Fitting Kits

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 Brass Fitting Kit Includes:**

Swagelok #	Description, qty included in kit
B-202-1	1/8" brass nut (20)
B-402-1	1/4" brass nut (20)
B-203-1	1/8" brass front ferrule (20)
B-403-1	1/4" brass front ferrule (20)
B-204-1	1/8" brass back ferrule (20)
B-404-1	1/4" brass back ferrule (20)
B-200-C	1/8" brass cap (6)
B-400-C	1/4" brass cap (6)
B-200-P	1/8" brass plug (6)
B-400-P	1/4" brass plug (6)
B-200-6	1/8" brass union (2)
B-400-6	1/4" brass union (2)
B-400-6-2	1/4" to 1/8" brass reducing union (2)
B-200-3	1/8" brass tee (2)
B-400-3	1/4" brass tee (2)
B-400-R-2	1/8" to 1/4" brass tube end reducer (2)
B-200-R-4	1/4" to 1/8" brass tube end reducer (2)
MS-IG-200	1/8" inspection gauge (1)
MS-IG-400	1/4" inspection gauge (1)

Swagelok Stainless Steel Fitting Kit Includes:

Swagelok #	Description, qty included in kit
SS-202-1	1/8" SS nut (20)
SS-402-1	1/4" SS nut (20)
SS-203-1	1/8" SS front ferrule (20)
SS-403-1	1/4" SS front ferrule (20)
SS-204-1	1/8" SS back ferrule (20)
SS-404-1	1/4" SS back ferrule (20)
SS-200-C	1/8" SS cap (6)
SS-400-C	1/4" SS cap (6)
SS-200-P	1/8" SS plug (6)
SS-400-P	1/4" SS plug (6)
SS-200-6	1/8" 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	1/8" SS tee (2)
SS-400-3	1/4" SS tee (2)
SS-400-R-2	1/8" to 1/4" SS tube end reducer (2)
SS-200-R-4	1/4" to 1/8" SS tube end reducer (2)
MS-IG-200	1/8" inspection gauge (1)
MS-IG-400	1/4" inspection gauge (1)

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

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

**Restek's Learning Network**

Sign up for our widely acclaimed seminars today!

Visit www.restek.com/seminars



nut



front ferrule



back ferrule



nut & ferrule set



plug



union



reducing union



tee



cross



tube end reducer



port connector



male connector



female connector



male quick coupling



female quick coupling

Swagelok® Fittings

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.

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.

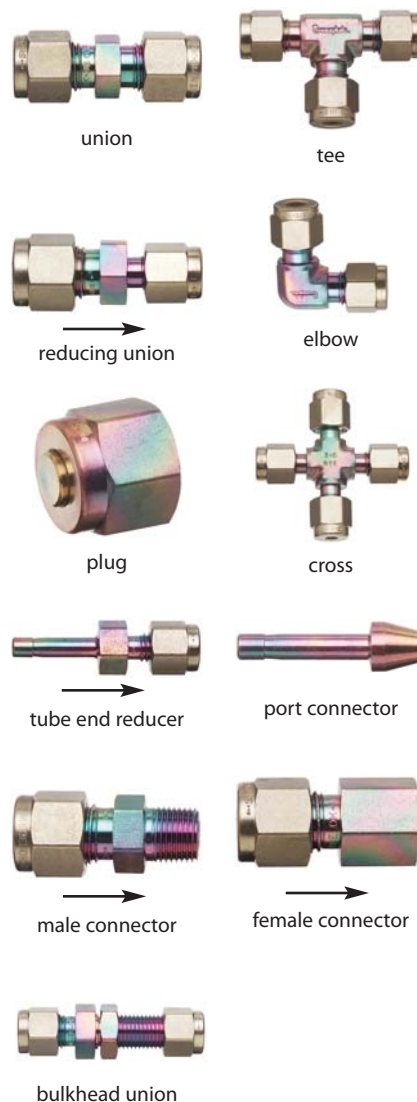
also available

Restek also carries specialized tools for Swagelok® fittings. See page 249.

Siltek®/Sulfinert® and Silcosteel®-CR Treated Swagelok® Fittings

- Full line of treated $\frac{1}{16}$ ", $\frac{1}{8}$ ", and $\frac{1}{4}$ " 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	$\frac{1}{16}$ "	SS-100-6	ea.	22540		ea.	22575	
	$\frac{1}{8}$ "	SS-200-6	ea.	22541		ea.	22576	
	$\frac{1}{4}$ "	SS-400-6	ea.	22542		ea.	22577	
	$\frac{3}{8}$ "	SS-600-6	ea.	22909		ea.	22904	
Tee	$\frac{1}{16}$ "	SS-100-3	ea.	22543		ea.	22578	
	$\frac{1}{8}$ "	SS-200-3	ea.	22544		ea.	22579	
	$\frac{1}{4}$ "	SS-400-3	ea.	22545		ea.	22580	
	$\frac{3}{8}$ "	SS-600-3	ea.	22910		ea.	22905	
Reducing Union	$\frac{1}{8}$ " to $\frac{1}{16}$ "	SS-200-6-1	ea.	22546		ea.	22581	
	$\frac{1}{4}$ " to $\frac{1}{16}$ "	SS-400-6-1	ea.	22547		ea.	22582	
	$\frac{1}{4}$ " to $\frac{1}{8}$ "	SS-400-6-2	ea.	22548		ea.	22583	
	$\frac{3}{8}$ " to $\frac{1}{4}$ "	SS-600-6-4	ea.	22911		ea.	22906	
Elbow	$\frac{1}{8}$ "	SS-200-9	ea.	22549		ea.	22584	
	$\frac{1}{4}$ "	SS-400-9	ea.	22550		ea.	22585	
Plug	$\frac{1}{8}$ "	SS-200-P	ea.	22573		ea.	22620	
	$\frac{1}{4}$ "	SS-400-P	ea.	22574		ea.	22597	
Cross	$\frac{1}{8}$ "	SS-200-4	ea.	22551		ea.	22586	
	$\frac{1}{4}$ "	SS-400-4	ea.	22552		ea.	22587	
Tube End Reducer	$\frac{1}{8}$ " tube to $\frac{1}{16}$ "	SS-100-R-2	ea.	22553		ea.	22588	
	$\frac{1}{4}$ " tube to $\frac{1}{16}$ "	SS-100-R-4	ea.	22554		ea.	22589	
	$\frac{1}{8}$ " tube to $\frac{1}{4}$ "	SS-400-R-2	ea.	22555		ea.	22590	
	$\frac{1}{4}$ " tube to $\frac{1}{8}$ "	SS-200-R-4	ea.	22556		ea.	22591	
Port Connector	$\frac{1}{8}$ "	SS-201-PC	ea.	22557		ea.	22592	
	$\frac{1}{4}$ "	SS-401-PC	ea.	22558		ea.	22593	
	$\frac{1}{8}$ " tube to $\frac{1}{4}$ "	SS-401-PC-2	ea.	22559		ea.	22594	
Male Connector	$\frac{1}{8}$ " to $\frac{1}{8}$ " NPT	SS-200-1-2	ea.	22561		ea.	22595	
	$\frac{1}{4}$ " to $\frac{1}{4}$ " NPT	SS-400-1-4	ea.	22562		ea.	22596	
	$\frac{1}{16}$ " to $\frac{1}{8}$ " NPT	SS-100-1-2	ea.	22563		ea.	22610	
	$\frac{1}{8}$ " to $\frac{1}{4}$ " NPT	SS-200-1-4	ea.	22564		ea.	22611	
	$\frac{1}{4}$ " to $\frac{1}{8}$ " NPT	SS-400-1-2	ea.	22565		ea.	22612	
	$\frac{3}{8}$ " to $\frac{3}{8}$ " NPT	SS-600-1-6	ea.	22912		ea.	22907	
Female Connector	$\frac{1}{8}$ " to $\frac{1}{8}$ " NPT	SS-200-7-2	ea.	22566		ea.	22613	
	$\frac{1}{4}$ " to $\frac{1}{4}$ " NPT	SS-400-7-4	ea.	22567		ea.	22614	
	$\frac{1}{4}$ " to $\frac{1}{8}$ " NPT	SS-400-7-2	ea.	22568		ea.	22615	
	$\frac{1}{8}$ " to $\frac{1}{4}$ " NPT	SS-200-7-4	ea.	22569		ea.	22616	
Bulkhead Union	$\frac{1}{8}$ "	SS-200-61	ea.	22570		ea.	22617	
	$\frac{1}{4}$ "	SS-400-61	ea.	22571		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 242.





Parker Fittings

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

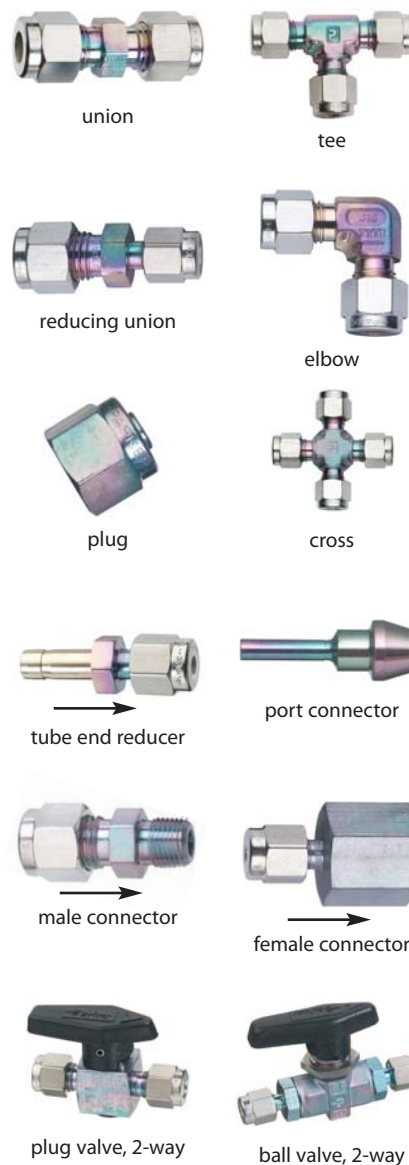
*Includes self-sealing shut-off valve.

Siltek®/Sulfinert® Treated and Silcosteel®-CR Treated Parker Fittings

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.

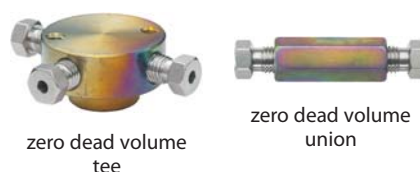
Fitting Type	Size	Parker #	Siltek/Sulfinert Treated			Silcosteel-CR Treated		
			qty.	cat.#	price	qty.	cat.#	price
Union	1/16"	1 SC 1	ea.	22520		ea.	22863	
	1/8"	2 SC 2	ea.	22521		ea.	22864	
	1/4"	4 SC 4	ea.	22522		ea.	22865	
Tee	1/16"	1 ET 1	ea.	22526		ea.	22866	
	1/8"	2 ET 2	ea.	22527		ea.	22867	
	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	1/16"	1 EE 1	—	—	—	ea.	22874	
	1/8"	1 EE 2	ea.	22530		ea.	22875	
	1/4"	1 EE 4	ea.	22531		ea.	22876	
Plug	1/16"	1 BLP 1	ea.	21539		ea.	22877	
	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		ea.	22888	
	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		ea.	22895	
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.



Siltek®/Sulfinert® Treated Valco® Fittings

Fitting Type	Size	Siltek/Sulfinert Treated		
		qty.	cat.#	price
Valco Zero Dead Volume Tee	1/16"	ea.	22534	
	1/8"	ea.	22535	
Valco Zero Dead Volume Union	1/16"	ea.	22532	
	1/8"	ea.	22533	





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 Restek 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 5mm 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 Restek 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 our patented deposition process. When we developed the Siltek® process, the application that showed the greatest benefit, among many we investigated, 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, we use the name Sulfinert® 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 specially cleaned for inertness by using the procedure for processing our Silcosteel® and Siltek®-treated products, because scrupulously clean parts are a prerequisite for a quality coating. This ensures you are getting a 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		21501	/ft.	21502	/ft.
0.02"	1/16"	21503		21504	/ft.	21505	/ft.
0.03"	1/16"	21506		21507	/ft.	21508	/ft.
0.04"	1/16"	21509		21510	/ft.	21511	/ft.
0.085"	1/8"	21512		21513	/ft.	21514	/ft.
0.21"	1/4"	21515		21516	/ft.	21517	/ft.

*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.

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	

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	enquire
16 to 30	enquire
31 to 75	enquire
76 to 99	enquire
100 to 200	enquire



tech tip

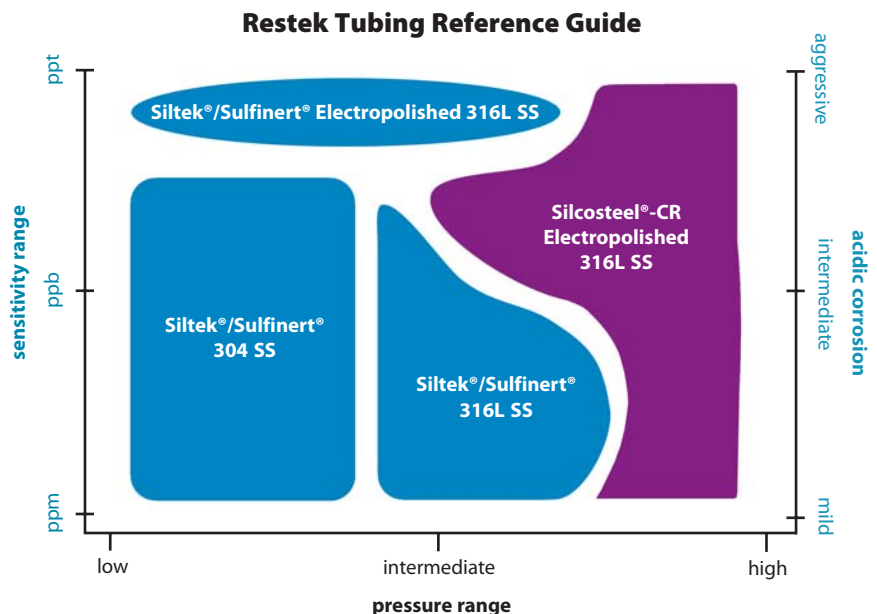
Plumbing a GC

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	enquire
16 to 30	enquire
31 to 75	enquire
76 to 99	enquire
100 to 200	enquire

Minimum Bend Radius for Coated Tubing

OD	Min. Bend Radius
≤ 1/16"	1" (2.5cm)
1/8"	2" (5.1cm)
1/4"	4" (10.2cm)
3/8"	6" (15.2cm)

did you **know?**

Other lengths and diameters of treated tubing are available on a custom basis.

Call for availability of lengths greater than 1,000ft.

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 Electropolished 316L Grade Stainless Steel Tubing

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	/ft. /ft.	/ft. /ft.		
1/4" (6.35mm)	0.180" (4.57mm)	0.035"	22539	/ft. /ft.	/ft. /ft.		

Silcosteel®-CR Treated Coiled Electropolished 316L Grade Stainless Steel Tubing

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	/ft. /ft.	/ft. /ft.		
1/4" (6.35mm)	0.180" (4.57mm)	0.035"	22537	/ft. /ft.	/ft. /ft.		

1/8" OD: 5 ft. to 100 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 304 Grade Stainless Steel Tubing

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	/ft. /ft.	/ft. /ft.		
0.029" (0.74mm)	0.021" (0.53mm)		22501	/ft. /ft.	/ft. /ft.		
1/16" (1.59mm)	0.010" (0.25mm)		22502	/ft. /ft.	/ft. /ft.		
1/16" (1.59mm)	0.020" (0.51mm)		22503	/ft. /ft.	/ft. /ft.		
1/16" (1.59mm)	0.030" (0.76mm)		22504	/ft. /ft.	/ft. /ft.		
1/16" (1.59mm)	0.040" (1.02mm)		22505	/ft. /ft.	/ft. /ft.		
1/8" (3.18mm)	0.085" (2.16mm)	0.020"	22506	/ft. /ft.	/ft. /ft.		
1/4" (6.35mm)	0.210" (5.33mm)	0.020"	22507	/ft. /ft.	/ft. /ft.		

Treated Seamless 316L Grade Stainless Steel Tubing

High durability tubing. Recommended for:

- inert applications.
- high temperatures.
- high pressures.
- corrosive environments.

Siltek®/Sulfinert® Treated Coiled 316L Grade Stainless Steel Tubing

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	/ft. /ft.	/ft. /ft.		
1/4" (6.35mm)	0.180" (4.57mm)	0.035"	22509	/ft. /ft.	/ft. /ft.		
3/8" (9.52mm)	0.277" (7.04mm)	0.049"	22914	/ft. /ft.	/ft. /ft.		

Silcosteel®-CR Treated Coiled 316L Grade Stainless Steel Tubing

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	/ft. /ft.	/ft. /ft.		
1/4" (6.35mm)	0.180" (4.57mm)	0.035"	22897	/ft. /ft.	/ft. /ft.		
3/8" (9.52mm)	0.277" (7.04mm)	0.049"	22915	/ft. /ft.	/ft. /ft.		

Treated Hydroguard™ Deactivated Stainless Steel Tubing

Hydroguard™ deactivation creates a high-density surface that is not readily attacked by aggressive hydrolysis. Recommended for:

- plumbing purge and trap systems.
- headspace systems.

Silcosteel® Treated Hydroguard™ Deactivated 304 Grade Stainless Steel Tubing

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	/ft.	/ft.	/ft.	/ft.
1/8" (1.59mm)	0.020" (0.51mm)		22496	/ft.	/ft.	/ft.	/ft.
3/16" (1.59mm)	0.030" (0.76mm)		22495	/ft.	/ft.	/ft.	/ft.
1/4" (1.59mm)	0.040" (1.02mm)		22494	/ft.	/ft.	/ft.	/ft.
1/2" (3.18mm)	0.085" (2.16mm)	0.020"	22493	/ft.	/ft.	/ft.	/ft.
3/4" (6.35mm)	0.210" (5.33mm)	0.020"	22492	/ft.	/ft.	/ft.	/ft.

Silcosteel® Treated Hydroguard™ Deactivated Seamless 316L Grade Stainless Steel Tubing

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	/ft.	/ft.	/ft.	/ft.
1/4" (6.35mm)	0.180" (4.57mm)	0.035"	22490	/ft.	/ft.	/ft.	/ft.

Silcosteel® Treated Hydroguard™ Deactivated Electropolished 316L Grade Stainless Steel Tubing

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	/ft.	/ft.	/ft.	/ft.
1/4" (6.35mm)	0.180" (4.57mm)	0.035"	22488	/ft.	/ft.	/ft.	/ft.

recommended for
purge & trap



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	enquire
16 to 30	enquire
31 to 75	enquire
76 to 99	enquire
100 to 200	enquire

Treated Straight, 6-Foot Length Stainless Steel Tubing**Silcosteel®-CR Treated Straight Seamless 316L Grade Stainless Steel Tubing**

- Individual 6-foot pieces.

In response to customer requests, we offer 6-foot straight lengths of 1/8-, 1/4-, and 3/8-inch Silcosteel®-CR treated tubing. This tubing can be cut to your exact requirements using a standard tubing cutter.

6 foot Length (± 1/2")

OD	ID	Wall Thickness	qty.	cat.#	price
1/4" (3.18mm)	0.055" (1.40mm)	0.035"	ea.	22898	
1/2" (6.35mm)	0.180" (4.57mm)	0.035"	ea.	22899	
3/8" (9.52mm)	0.277" (7.04mm)	0.049"	ea.	22900	

Siltek®/Sulfinert® Treated Straight Seamless 316L Grade Stainless Steel Tubing

- Individual 6-foot pieces.

In response to customer requests, we offer 6-foot straight lengths of 1/8-, 1/4-, and 3/8-inch Siltek®/Sulfinert® treated tubing. This tubing can be cut to your exact requirements using a standard tubing cutter.

6 foot Length (± 1/2")

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	

ordering note

Required length in meters x 3.2808 = length in feet.

did you know?

Other lengths and diameters of treated tubing are available on a custom basis.

Call for availability of lengths greater than 1,000ft.



Toggle valve—
instant on/off control



Ball valve—leak-free
bidirectional sealing



Plug valve—leak-free
at wide temperature
swings

Parker Balston® Shut-Off Gas Valves

Toggle gas valves are ideal for applications in which instant on/off gas control is necessary. They are rated to 200psig at 21°C and have a maximum operating temperature of 148°C.

Ball valves have a floating ball to assist sealing and to reduce operating torque, and dual seats to provide leak-tight bidirectional sealing. They are rated to 1,500psig at 21°C and have a maximum operating temperature of 177°C.

Plug valves work well in any application requiring throttling or on/off operations. Parker plug valves remain leak-free even when subjected to wide temperature swings. They are rated to 3,000psig at 21°C and have a maximum operating temperature of 205°C.

	1/8" Brass		1/4" Brass		1/8" Stainless Steel		1/4" Stainless Steel	
Valve Type	cat.#	ea.	cat.#	ea.	cat.#	ea.	cat.#	ea.
Toggle	22188		22189		22190		22191	
Ball	22192		22193		22194		22195	
Plug	22196		22197		22198		22199	



Optional knob for
accurate
control of low flow

Parker Balston® Precision Metering Gas Valves

Parker valve stem threads do not contact the fluid stream, making these metering valves ideal for high-purity applications. The O-ring seal and stem threads are coated with a low vapor pressure, silicone lubricant for optimum performance.



22200

	1/8" Nickel-Plated Brass		1/4" Nickel-Plated Brass		1/8" Stainless Steel		1/4" Stainless Steel	
Valve Type	cat.#	ea.	cat.#	ea.	cat.#	ea.	cat.#	ea.
Metering, straight	22200		22201		22204		22205	

Vernier Knob for Metering Valve: cat.# 22209 (ea.)

Restek Electronic Leak Detector

Why have a small leak turn into a costly repair? Protect your data 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).



22839

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, Japan
Compliance:	WEEE, RoHS

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



22658

For more details on Restek's Leak Detector, see page 137.

Description	qty.	cat.#	price
Leak Detector with Universal Charger Set (US, UK, European, Australian)	ea.	22839	
Soft-Side Carry/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.



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



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 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, 10mm.

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.



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	



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



8" x 6 1/4" 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, 50–60Hz.*

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).



20188

Tubing Burring & Reaming Tool

Removes burrs and reams tubing.

Description	qty.	cat.#	price
1/16" Tubing Dressing Tool	ea.	20188	
Replacement Insert for 1/16" Tubing Dressing Tool	ea.	20189	
1/8" Tubing Dressing Tool	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 $\frac{1}{8}$ -inch, $\frac{3}{16}$ -inch, or $\frac{1}{4}$ -inch tubing.
- Assists in making accurate left-hand, right-hand, or offset bends.

Description	qty.	cat.#	price
Tubing Bender	ea.	23009	



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	



22626

Heavy-Duty Tube Bender

- Allows precise bending of $\frac{1}{4}$ " tubing.
- Patented swivel handle can be repositioned easily, allowing easy fabrication of bends up to 180°.
- Does not score or flatten tubing.
- Calibrated to show angle of bend.

Description	qty.	cat.#	price
Heavy-Duty Tube Bender	ea.	22626	



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 $\frac{1}{4}$ " or 6mm 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	

ResTape Teflon® Tape

- For threaded connections in a wide range of plumbing materials.
- Each roll is $\frac{1}{2}$ " x 260".
- Maximum temperature: 260°C.



Description	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.



22625

Strap Wrench

- Securely grip large, hard to turn items.
- Safely grip sample cylinders without damage when installing valves.
- Large capacity: 8" diameter cylinder.

Description	qty.	cat.#	price
Strap Wrench	ea.	22625	



22624

Gap Inspection Gauge

- Confirm that fittings are sufficiently tightened.
- For use with $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ " Swagelok® fittings.
- For Swagelok® fittings in new installations only.

Description	qty.	cat.#	price
Gap Inspection Gauge	ea.	22624	