

Column Installation



Top: Jason Martin, Buyer/Planner

Bottom: Scott Grossman and Amanda Rigdon,
Application Chemists

Restek Electronic Leak Detector

- Reliable thermal conductivity leak detector.
- Responds to leaks in less than 2 seconds.
- Audible alarm plus LED readout.
- Auto zeros with the touch of a button.
- Built-in rechargeable 7.2-volt battery.

Improve GC Performance; Save Your Column!

Avoid poor chromatography caused by leaks—leak check your GC system with the Restek Electronic Leak Detector, the affordable, reliable tool for detecting leaks. Features include internal battery charge capability, a low-battery indicator, a battery charge indicator light, yellow lights to signal a nitrogen leak, a repositioned on/off switch to eliminate accidentally powering on the unit, and a probe tip design that prevents debris from entering the unit. The leak detector's technology enables high sensitivity in a compact unit, the autozero feature allows instantaneous zeroing with the touch of a button, and the ergonomic design puts all controls at your fingertips, for maximum ease of use.

Leaks can cause detector noise and baseline instability, waste carrier gas, and shorten column lifetimes, so leak checks should be a regular part of a GC maintenance program. The Restek Electronic Leak Detector responds in less than 2 seconds to leaks of gases with thermal conductivities different from air, indicating leaks with both an audible alarm and an LED readout. The leak detector detects minute gas leaks that can go undetected by liquid leak detectors. Liquid leak detectors should not be used on a capillary GC system; liquids drawn into the system through the leaks will contaminate the system.

How does the Restek Electronic Leak Detector work?

The Restek Electronic Leak Detector detects minute leaks of any gas with thermal conductivity different from air. The reference gas inlet draws in ambient air for comparison to air drawn into the sample probe. A thermal conductivity difference between the two indicates a leak, and the leak is revealed to the user by both an LED bar graph and an audible tone. The leak detector operates on one rechargeable 7.2-volt Ni-MH battery (included).

Leak Detector Facts

Detectable Gases:	helium, nitrogen, argon, and carbon dioxide
Battery:	Rechargeable Ni-MH, 7.2-volt
Operating	
Temperature Range:	32°-120°F (0°-48°C)
Humidity Range:	0-97%
CE Approved:	Yes



Easy-to-clean probe assembly

Description	qty.	cat.#
Leak Detector with 110Volt Battery Charger	ea.	22451
Leak Detector with 220Volt European Battery Charger	ea.	22451-EUR
Leak Detector with 220Volt UK Battery Charger	ea.	22451-UK

Caution: The Restek Electronic Leak Detector is NOT designed for determining leaks of combustible gases. 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.

Leak Detector Accessory Kit

The kit includes an adaptor fitting to detect leaks in hard-to-reach locations, and a mounting bracket that can be affixed to the wall or GC.



Verify hard-to-reach leaks with the adaptor fitting.



Description	qty.	cat.#
Leak Detector Accessory Kit (adaptor fitting for probe, mounting bracket)	kit	22453



Small, compact unit—easy to hold and operate.



Leak Detector is easily accessed when stored in the mounting bracket.

Flow Meter, Methane Cylinder Kit, Column Rinsing Kit



Soap Film Bubble Flowmeters

- 1mL flowmeter measures flows between 0.1 and 10cc/min.
- 50mL flowmeter designed 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.#
1mL Bubble Flowmeter	ea.	20135
50mL Bubble Flowmeter	ea.	20136



cat.# 20197

Methane Cylinder Kit

Setting the column flow rate by injecting methane and optimizing linear velocity is a preferred method for establishing reproducible retention times (ASTM Method E1510-93). Measuring the linear velocity of your carrier gas is made easy by using our Methane Cylinder Kit. 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.#
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.#
Rinsing Reservoir Complete Kit	kit	20612
Rinsing Reservoir only	ea.	20613

it's a fact

Restek On-The-Road training seminars are full-day courses presented in an engaging multimedia format. They are equally valuable to beginning chromatographers, those who have moderate experience and want a better understanding of the subject matter, and those interested in the "best practices" and latest technologies. **No sales pitch is presented**, just the facts on how to make your chromatography results better. The bulk of each course is lecture, but numerous demonstrations and problem-solving exercises facilitate and reinforce the understanding of important principles. See **page 11** for more information.

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 $\frac{3}{16}$ " 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



For Agilent GCs
(cat.# 22186)



For PerkinElmer GCs
(cat.# 22185)



For Shimadzu GCs
(cat.# 22182)



For Thermo
Scientific GCs
(cat.# 22183)



For Varian GCs
(cat.# 22184)

Description	qty.	cat.#
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

did you **know?**

Make Life Easier!

MLE Tool Kits conveniently provide the tools that make it easier to install and maintain capillary columns!

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innovation!



Make clean,
square cuts!

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

Scoring Wafer with Handle

qty.

2-pk.

cat.#

23015



Ceramic Scoring Wafers

- 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

Ceramic Scoring Wafers

qty.

5-pk.

cat.#

20116



Sapphire Scribe

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



One quick stroke...



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

Description

Sapphire Scribe

qty.

ea.

cat.#

20182



cat.# 23027

cat.# 23026

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

Shortix® Capillary GC Column Cutter

Maintenance Kit for Shortix® Capillary GC Column Cutter (includes diamond cutting wheel, O-rings, and a tool to open the column cutter)

qty.

ea.

cat.#

23026

kit

23027

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.
- Color-coded for identifying detector and injector ends.
- Not recommended for reuse.



Description

Capillary Column Caps

qty.

10-pk.

cat.#

21044

Capillary Installation Gauge

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

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Easily seat ferrules for consistent installations!



A) for Agilent-style fittings (compact ferrules)



B) for 1/16" fittings (1/16" ferrules)



C) for Thermo Scientific TRACE™ & Focus SSL (M4 ferrules)



D) for Varian GCs for use with 1/16" ferrules



E) for Shimadzu 17A, 2010, and 2014 GCs

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

*Recommended for use with graphite ferrules.

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.



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.#
Capillary Installation Gauge for Agilent 5973/5975 MS	G1099-20030	ea.	21894



No more burned fingers!

Inlet Liner Removal Tool

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



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



Slowly pull the liner out of the injection port.



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

Description

Inlet Liner Removal Tool

qty.

3-pk.

cat.#

20181

Inlet Liner Packing Tool

- Position wool reproducibly every time.
- Accurate to a specific, measured depth.

Eliminates user variation!



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



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



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

Description

Inlet Liner Packing Tool

qty.

ea.

cat.#

20339

Mini Wool Puller/Inserter

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

**Description**

Mini Wool Puller/Inserter

qty.

2-pk.

cat.#

20114

Rethreading Tool

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

Achieve a better seal!



cat.# 23018

**damaged threads**

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.



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.

**repaired threads****Description**

Rethreading Tool for 1/16" compression fitting

qty.

ea.

cat.#

23016

Rethreading Tool for 1/8" compression fitting

ea.

23017

Rethreading Tool for 1/4" compression fittings (Agilent split/splitless injection ports)

ea.

23018

Rethreading Tool for 7/16" compression fitting (Varian injection ports)

ea.

23019

Rethreading Tool for 1/4" Varian-style capillary column fittings

ea.

21893

Injector Wrench for Agilent 5890/6890/6850 GCs

- Use to remove the septum nut and weldments during GC maintenance.
- High-quality stainless steel construction.
- Meets original equipment performance.



Use the smaller end to remove the septum nut.



Use the larger end to tighten the split/splitless weldment nut.



Description	Similar to Agilent part #	qty.	cat.#
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.#
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.#
$\frac{1}{4}$ " 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.#
Open-End Wrench Set	set	20387

**Open-End Wrenches**

High-quality wrenches for tightening capillary fittings.

Description	qty.	cat.#
Open-End Wrenches ($\frac{1}{4}$ " x $\frac{5}{16}$ ")	2-pk.	20110
Open-End Wrenches ($\frac{3}{8}$ " x $\frac{7}{16}$ ")	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.#
Metric Wrench Set	set	22997

**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.#
Metric 9 Piece Ball-Point Hex Key Set	set	22999

**12 Piece Ball-Point Hex Key Set**

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

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



Column Installation Tools



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.#
Slide-Lock Tweezers and 15cm Compact Steel Ruler	set	20101



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.#
High-Temperature String	10m	20109
High-Temperature String	450m	20618



Stainless Steel Tube Brushes/Surface Brush

Unlike brass brushes that can leave a metal residue, these stainless steel tube brushes ($\frac{3}{8}$ -, $\frac{3}{16}$ -, and $\frac{1}{4}$ -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.#
Stainless Steel Tube Brushes/Surface Brush	4-piece set	20112



Nylon Tube Brushes and Pipe Cleaner

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

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



4" Tapered Needle Files

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

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



MXT™ Needle Files

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

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



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.#
Mini Hand Drill Set	3-piece set	20122



Stainless Steel Jet Reamers

A great tool for cleaning detector jets and other small orifices. Serrated design is optimal for removing silica deposits and other contaminants. Ideal for removing ferrules that have become stuck in fittings.

Description	qty.	cat.#
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.

Description	qty.	cat.#
Pocket Magnifier	ea.	20124

Temperature Measuring Stick

- Verify GC oven or polymer temperature.
- Quick measurements via sensor in the measuring tip.
- Swivel head can turn 180°.
- Wide measuring range: -50°C to +350°C.

Description	qty.	cat.#
Temperature Measuring Stick	ea.	22066

**Flashlight with Swivel Head**

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

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

**FIX-IT Laboratory Swiss Army Knife**

- 15-function tool includes inlet liner remover, screwdrivers, scissors, blade, and tweezers.
- Includes a magnifying glass to check column end cuts.
- Genuine Swiss Army quality with 5-year warranty.
- Every GC analyst should have one!

Description	qty.	cat.#
FIX-IT Laboratory Swiss Army Knife	ea.	23013

**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.

Description	qty.	cat.#
Septum Puller	ea.	20117

save **money!**

You can save money on column installation tools by purchasing the new MLE Capillary Tool Kits described on **page 209**.

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

**Liner Cap Removing Tool for Thermo Scientific GCs:****Focus GC / TRACE™ GC / Ultra/TRACE™ GC x GC**

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

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



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Steve Kreiser
Director of Quality
11+ years of service!

Inlet and FID Maintenance Kits

- 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.



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



FID Kit for Agilent 5890 GCs



FID Kit for Agilent
6850/6890/7890 GCs

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.

also **available**

MLE Capillary Tool Kits.
See **page 209**.

new and improved!

Now with even more tools!

Description	qty.	cat.#
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

Vespel® Ferrules

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

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® ferrules

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.#
0.4mm	0.25mm	10-pk.	21036
0.5mm	0.32mm	10-pk.	21037
0.8mm	0.53mm	10-pk.	21038



Reusable!

Compact Ferrules—For Agilent 5890/6890/6850 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.	20241
1/16"	0.5mm	0.32mm	5-pk.	20242
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 more ferrule fragments in the transfer line.
- 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.#
0.4mm	0.25mm	10-pk.	21472
0.5mm	0.32mm	10-pk.	21473
0.8mm	0.53mm	10-pk.	21474

*Patent pending.



Teflon® Ferrules

- Upper temperature limit 250°C.
- 100% Teflon®; completely inert.
- One-piece design requires no back ferrule.

Fitting Size	Ferrule ID	qty.	cat.#
1/32"	1/32"	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—For M4 Fittings for Thermo Scientific TRACE™ and Focus SSL**

Ferrule ID	Fits Column ID	Similar to TS part #	Graphite	Graphite
			2-pk.	10-pk.
0.3mm	0.10/0.15mm	—	22221	22222
0.4mm	0.18/0.28mm	290-13488	20280	20281
0.5mm	0.32mm	290-13487	20282	20283
0.8mm	0.45/0.53mm	290-13486	20284	20285

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

- For use with packed columns.
- Graphite composition.

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

**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.



Terri Sowerby
Shipping/Assembly
Manager
3+ years of service!

Stainless Steel Jet Reamers

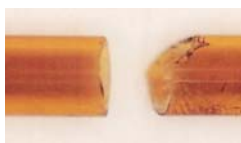
A great tool for cleaning detector jets and other small orifices. Serrated design is optimal for removing silica deposits and other contaminants. Ideal for removing ferrules that have become stuck in fittings.



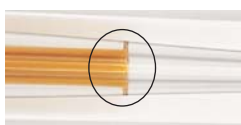
Dislodge ferrules or remove silica deposits with the Jet Reamer/ Ferrule Remover.



Description	qty.	cat.#
Stainless Steel Jet Reamers	6-piece set	20113



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.



For a secure, reliable connection, use a Vu2 Union™ Connector. See [page 222](#).

for more info

These guard columns are intermediate polarity (IP) deactivated.

For more information about guard columns and other deactivations, see [pages 26–30](#).

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. We have thoroughly investigated the taper angle and tolerances to ensure a leak-tight fit on every connector.

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. Mass spectroscopists use Press-Tight® connectors for connecting analytical columns to smaller-diameter transfer lines.

How does a Press-Tight® connector work?

A Press-Tight® connector forms a leak-tight seal through concentric compressive forces as the tubing end is pushed into a tightly controlled radial restriction. These forces are strong enough to form a leak-tight seal under the normal pressures used in capillary GC. The seal is further strengthened as the polyimide resin coating on the exterior of the column bonds to the inner surface of the connector after several thermal cycles to 200°C.

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 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.# 22451, page 207) 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.

Can the connection be strengthened?

Absolutely. A curable polyimide resin (cat.# 20445, page 221) is available to create a strong, permanent seal. A Vu2 Union™ connector creates a secondary seal to ensure a leak-tight connection. However, clean, square cut ends and a good press-tight seal still must be made for the connection to be effective.

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 222) or SeCure™ “Y” Connector (page 223) 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 226).

Let Restek make the guard column/transfer line connection for you!

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

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

Universal Press-Tight® Connectors

- Connect a guard column to an analytical column.
- Repair a broken column.
- Connect a column outlet to a transfer line.
- 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	5-pk.	25-pk.	100-pk.
Universal Press-Tight® Connectors	20400	20401	20402
Deactivated, Universal Press-Tight® Connectors	20429	20430	20431
Siltek® Treated Universal Press-Tight® Connectors	20480	20449	20481

**Universal Angled Press-Tight® Connectors**

- Ideal for connecting a guard column to an analytical column.
- Made from inert fused silica.
- Angle approximates the curvature of a capillary column, reduces strain on column-end connections.
- 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	5-pk.	25-pk.	100-pk.
Universal Angled Press-Tight® Connectors	20446	20447	20448
Deactivated Universal Angled Press-Tight® Connectors	20446-261	20447-261	20448-261
Siltek® Treated Universal Angled Press-Tight® Connectors	20482	20483	20484

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

An alternative method of performing dual-column confirmational analyses!

- Split sample flow onto two columns.
- Split a single column flow to two detectors—perform confirmation analysis with a single injection.
- 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.	3-pk.
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.
- Made from inert fused silica.
- Inlet and outlet ends conform to the column curvature—alleviates column-end connection strain.
- 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.	3-pk.
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

**Universal “X” Press-Tight® Connectors**

- Connect a column to three detectors.
- Connect a column to two detectors and a sniffer port.
- Split sample flow onto three columns.
- Deactivated Press-Tight® connectors assure better recovery of polar and nonpolar compounds.
- Fit column ODs from 0.33–0.74mm (Restek 0.1mm–0.53mm ID).

Description	ea.	3-pk.
Universal “X” Press-Tight® Connector	20407	20408
Deactivated Universal “X” Press-Tight® Connector	20407-261	20408-261
Siltek® Treated Universal “X” Press-Tight® Connector	20407-266	20408-266

**Polyimide Resin**

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

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





Patent pending.

Secure, reliable
column-to-column
connections!

NOTE: This product is not recommended for GC column-to-MS connections—use the Vacuum Vu-Union® (page 224).

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.

Restek's Vu2 Union™ connector combines the simplicity of a Press-Tight® union with the strength of a metal union. The Vu2 Union™ connector reliably couples one analytical column to another, or to a transfer line or guard column. The columns cannot unexpectedly disconnect, even at temperatures as high as 400°C.

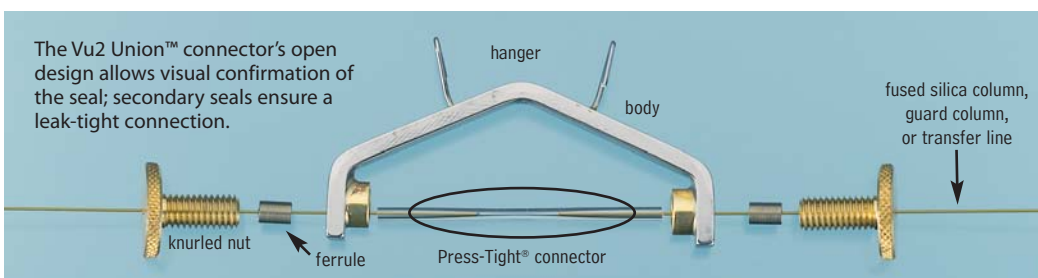
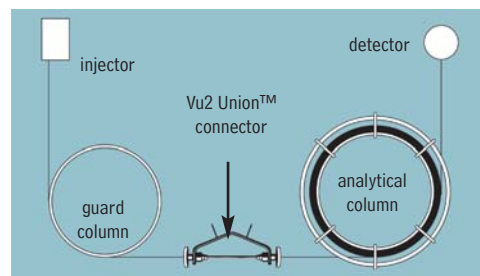
How does a Vu2 Union™ connector work?

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.

A guard column connected to an analytical column by a Vu2 Union™ connector.



Kits include: Vu2 Union™ body, 2 knurled nuts, 2 Press-Tight® unions, and 4 ferrules

Description	Ferrules Fit Column ID	qty.	cat.#
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.	25-pk.	100-pk.
Universal Press-Tight® Connectors	20400	20401	20402
Deactivated, Universal Press-Tight® Connectors	20429	20430	20431
Siltek® Treated Universal Press-Tight® Connectors	20480	20449	20481

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.	Graphite 10-pk.
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

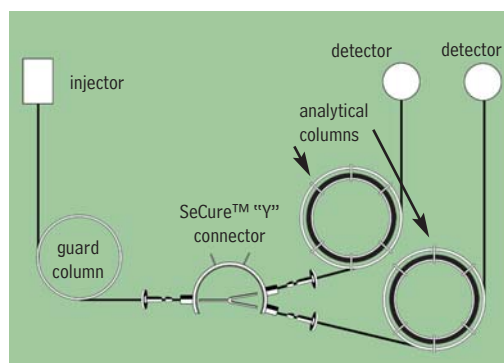
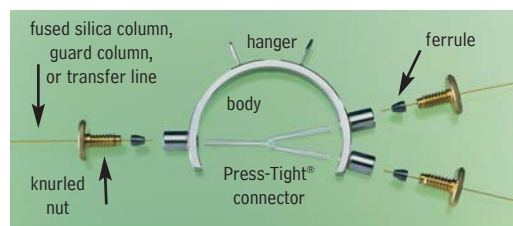
SeCure™ "Y" Connector Kits

- 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.

The SeCure™ "Y" Connector's open design allows visual confirmation of the seal.

Dual-column confirmational analysis with a single injection—one of the SeCure™ "Y" connector's many uses.



Patent pending.

Secure, reliable
column-to-column
connections!

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

Description	Ferrules Fit Column ID	qty.	cat.#
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

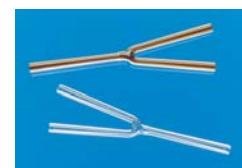
- Split sample flow onto two columns.
- Split a single column flow to two detectors—perform confirmation analysis with a single injection.
- Deactivated Press-Tight® connectors assure better recovery of polar and non-polar compounds.
- Siltek® treated connectors are ideal for organochlorine pesticides analysis.
- Fit column ODs from 0.33–0.74mm (Restek 0.1mm–0.53mm ID).

Description	ea.	3-pk.
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.	Graphite 50-pk.
0.4mm	0.18/0.25/0.28mm	20200	20227
0.5mm	0.32mm	20201	20228
0.8mm	0.45/0.53mm	20202	20224



Vacuum Vu-Union® & Gerstel GRAPHPAK® Connectors



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.



Kim Holliday
Southwest/Mountain
States Sales
Representative
16+ years of service!

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

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.



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.#
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

Gerstel GRAPHPACK® 3D/2 Connectors

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.#
GRAPHPACK® 3D/2 Connector* (0.25mm to 0.32mm ID)	ea.	20272
GRAPHPACK® 3D/2 Connector* (0.45mm to 0.7mm ID)	ea.	20273

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

GRAPHPACK® 3D/2 Ferrules



Ferrule ID	Fits Column ID	qty.	cat.#
0.4mm	0.25mm	10-pk.	20271
0.5mm	0.32mm	10-pk.	20270
0.8mm	0.45/0.53mm	10-pk.	20274

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 350°C.
- Available in union and “Y” configurations.

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.

please note

Use for fused silica-to-fused silica or fused silica-to-metal connections.

SILTEK®
treated

**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.#
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.#
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

1/32-Inch Replacement Nut

Description	qty.	cat.#
1/32" Replacement Nut	5-pk.	20389

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

Restek recommends a one-piece adaptor ferrule for use in fittings in which the ferrule will not be removed. Connections are made or broken by tightening or loosening the fitting nut and sliding the tubing in or out. 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.#
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	ZF5V-5	5-pk.	20141
1/32" Replacement Nut			5-pk.	20389



Ferrule



Replacement Nut

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.#
Ferrule Removal Kit	FRK1	kit	20146

MXT™ Connectors for Metal Tubing

please note

Use for metal-to-metal connections.

SILTEK®
treated

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

These low-dead-volume connectors are Siltek® treated and are deactivated to make them inert to active compounds, just like our MXT® columns. They can be used at temperatures up to 400°C without degrading the deactivated layer. Purchase the appropriate ferrules for connecting 0.28 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.

Each kit contains the MXT™ union, two 1/32-inch ferrules and nuts.



Description	qty.	cat.#
For 0.28mm ID MXT® Columns	kit	20397
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.#
For 0.28mm ID MXT® Columns	kit	20396
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.#
0.59mm	0.28mm	10-pk.	20398
0.79mm	0.53mm	10-pk.	20399

1/32-Inch Replacement Nut



Description	qty.	cat.#
1/32" Replacement Nut	5-pk.	20389

1/4-Inch–3/16-Inch Open-End Wrenches

High-quality miniature wrenches to use with MXT™ low-dead-volume connectors.



Description	qty.	cat.#
1/4"–3/16" Open-End Wrenches	2-piece set	20388

tech tip

Coupling GC Columns

An MXT™ connector is a good alternative to a glass connector when coupling GC columns. This connector is constructed from stainless steel and will not break; it uses ferrules for sealing. The design ensures low dead volume, and Siltek® treatment ensures the MXT™ connector is inert—both features help minimize peak tailing. MXT™ connectors can be used to connect metal-to-metal, metal-to-fused silica, or fused silica-to-fused silica tubing. When connecting metal tubing, use 1/32-inch stainless steel ferrules (listed above); for fused silica tubing, use Valcon polyimide adaptor ferrules (see page 225).

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.#
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



also **available**

Treated Fittings!

See pages 392-393 for our Siltek®/Sulfinert® treated and Silcosteel®-CR treated fittings.

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.#
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.#
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.#
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.#
1/8" 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.#
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**

				Valcon Polyimide		Polyimide	
Tubing OD	Tubing ID	Valco® #	qty.	cat.#	qty.	cat.#	
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	—	—	

