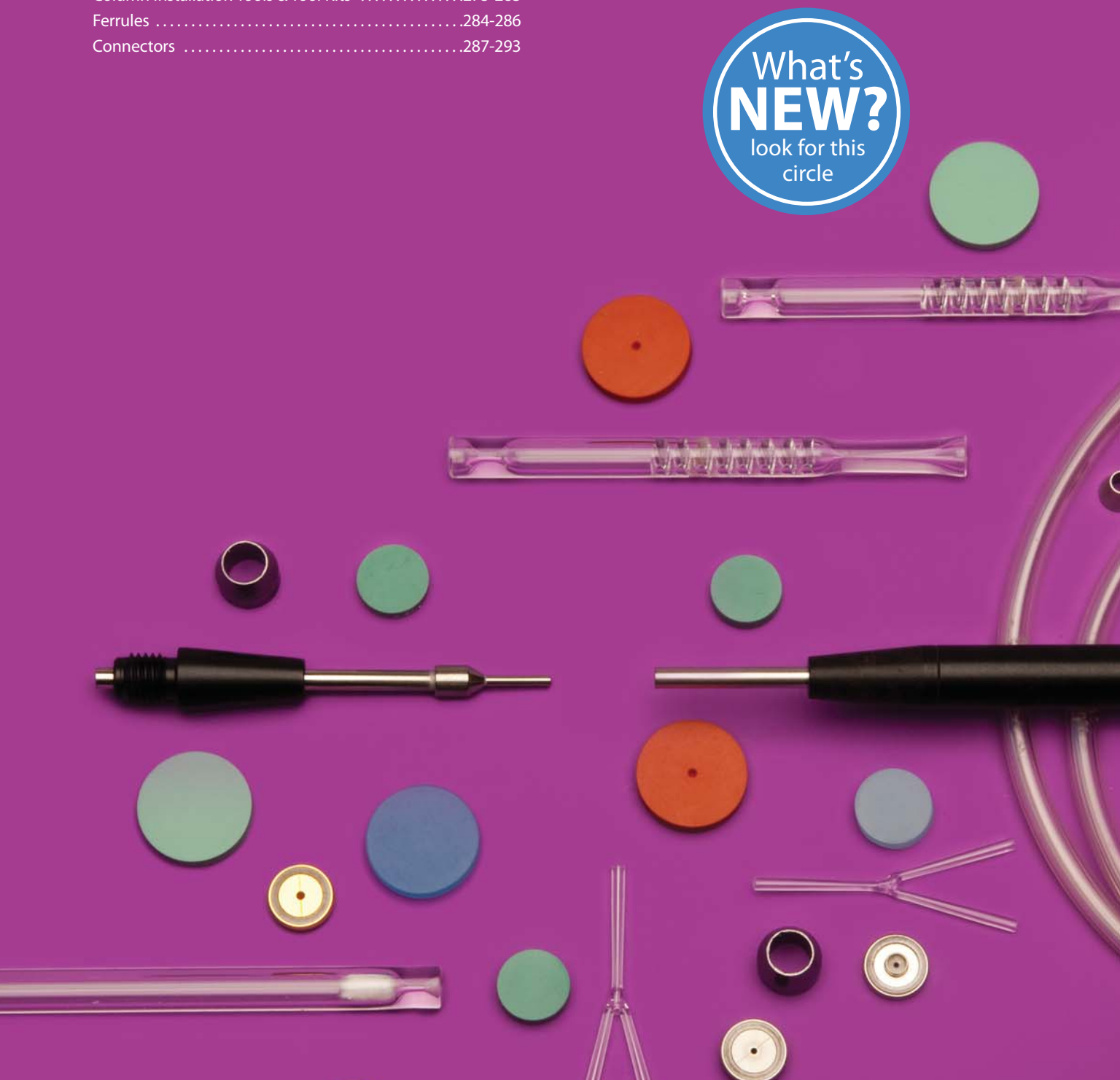


GC ACCESSORIES

COLUMN INSTALLATION

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

What's
NEW?
look for this
circle



RESTEK

HROMalytic
ECHnology Pty Ltd

+61(0)3 9762 2034

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

11/12

Restek Electronic Leak Detector

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

Features & Benefits include:

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

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

Leak Detector Facts

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

Limits of Detection

These gases can be detected with the 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 Hard-Sided Carrying Case and Universal Charger Set (US, UK, European, Australian)	ea.	22839	
Leak Detector Routine Maintenance Review**	ea.	22839-R	
Soft-Side Storage Case	ea.	22657	
Small Probe Adaptor	ea.	22658	

*Caution: The Restek Electronic Leak Detector is designed to detect trace amounts of hydrogen in a noncombustible environment. It is NOT designed for determining leaks in a combustible environment. A combustible gas detector should be used for determining combustible gas leaks under any condition. The Restek Electronic Leak Detector may be used for determining trace amounts of hydrogen in a GC environment only.

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



Checking for leaks maintains the integrity of a GC system.

i tech tip

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

for more info

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



22839



22839

Hard-sided carrying case included with purchase of unit.



22657

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

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



22658

i tech tip

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

Lab Gas Issues?

RESTEK HAS THE SOLUTION!

NEW!



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

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

NEW Restek ProFLOW 6000 Electronic Flowmeter

State-of-the-art features include:

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



Hard-sided carrying case included with purchase of unit.



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

restek **innovation!**

Flowmeter Facts:

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

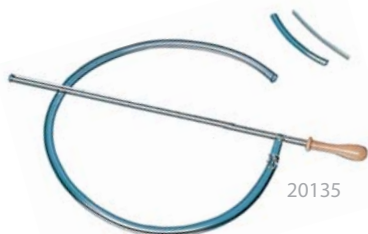
Description	qty.	cat.#	price
Restek ProFLOW 6000 Electronic Flowmeter with Hard-Sided Carrying Case	ea.	22656	
ProFLOW 6000 Recalibration Service	ea.	22656-R	
Soft-Side Storage Case	ea.	22657	

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

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

restek **recommends**

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



Soap Film Bubble Flowmeter

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

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

Methane Cylinder Kit

Setting the column flow rate by injecting methane and optimizing linear velocity is a preferred method for establishing reproducible retention times (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 50 ml rinsing reservoir is equipped with 1/4-inch inlet and outlet connections and includes a built-in fritted disk to prevent particulate matter from contaminating the column. The kit includes: reservoir, pressure regulator, fittings, ferrules, and tubing. Reservoir also available separately.

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



FID Flow Measuring Adaptor

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

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

Inlet and FID Maintenance Kits for Agilent GCs

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

Inlet kit includes:

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



FID kits include:

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



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



22185



22186



22182



22184



MLE Tool Kits conveniently provide the tools that make it easier to install and maintain capillary columns at a discounted price compared to buying the tools individually!



22183

Make Life Easier (MLE) Capillary Tool Kits

Everything you need in one complete kit!

All kits include these components:

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

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

also includes:

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

MLE Capillary Tool Kit for PerkinElmer GCs

(cat.# 22185) also includes:

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

MLE Capillary Tool Kit for Shimadzu GCs

(cat.# 22182) also includes:

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

MLE Capillary Tool Kit for Thermo Scientific GCs

(cat.# 22183) also includes:

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

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

also includes:

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

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

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

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

Scoring Wafer with Handle

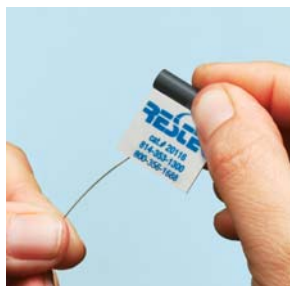
- Ceramic wafer is serrated on one side and straight-edged on the other to cut both fused silica and metal tubing cleanly.
- Unique, ergonomic handle is made of soft, comfortable rubber.



Description	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 0.25 mm ID to 0.53 mm ID tubing (0.78 mm OD maximum).



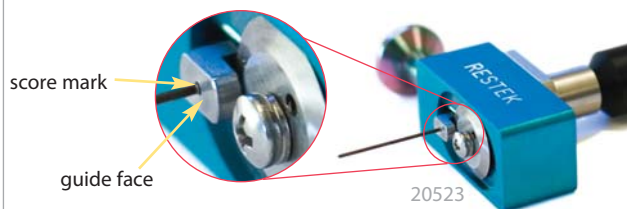
23027



23026

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

Enlarged view—score mark flush with guide face.



20523

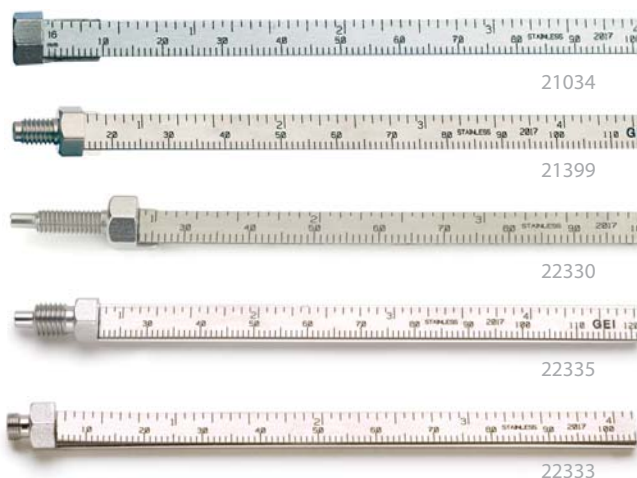
Restek Tubing Scorer

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

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

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

Easily seat ferrules for consistent installations!



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.



did you know?

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



21894

Capillary Installation Gauge

for Agilent 5973/5975 MS

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



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



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



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

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



22858

21044

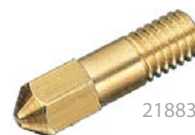
Capillary Column Caps

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

Injector/Detector Plug Nuts

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



21883

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

restek innovation!

No more burned fingers!

Inlet Liner Removal Tool

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



20181



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



Slowly pull the liner out of the injection port.



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

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



20339

Inlet Liner Packing Tool

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



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



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



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

Eliminates user variation!

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

No more burned fingers!



26262

26261

The Claw and The Claw Holder Kit

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

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



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



20114

Mini Wool Puller/Inserter

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

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

Sky Introducing
Inlet Liners **Sky™ Liners**

RESTEK

See page 206 for more details.

Rethreading Tool

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



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

**Achieve a better seal!**

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

Description	qty.	cat.#	price
Rethreading Tool for $1/16"$ compression fitting	ea.	23016	
Rethreading Tool for $1/8"$ compression fitting	ea.	23017	
Rethreading Tool for $1/4"$ compression fittings (Agilent split/splitless injection ports)	ea.	23018	
Rethreading Tool for $7/16"$ compression fitting (Varian injection ports)	ea.	23019	
Rethreading Tool for $1/4"$ Varian-style capillary column fittings	ea.	21893	

Injector Wrench

for Agilent 5890/6890/6850 GCs

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



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

**Injector Wrench**

for Shimadzu 17A, 2010, and 2014 GCs

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

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

**Open-End Wrench Set**

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

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

**Open-End Wrench Set**

High-quality $1/4"$ x $5/16"$, $3/8"$ x $7/16"$, $7/16"$ x $1/2"$, and $1/2"$ x $9/16"$ wrenches for tightening a wide variety of chromatography fittings.

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

**Open-End Wrenches**

High-quality wrenches for tightening capillary fittings.

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

**Metric Wrench Set**

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

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



22999

Metric 9 Piece Ball-Point Hex Key Set

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

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



22998

12 Piece Ball-Point Hex Key Set

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

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

Torx® Screwdriver Set

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



23034

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



20109

High-Temperature String

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

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



20101

Slide-Lock Tweezers and 15 cm Compact Steel Ruler

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

- Useful for many laboratory tasks.

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



20112

Stainless Steel Tube Brushes/Surface Brush

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

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



20108

Nylon Tube Brushes and Pipe Cleaner

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

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



20106

4" Tapered Needle Files

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

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

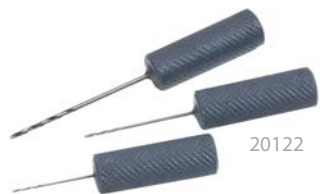


21601

MXT® Needle Files

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

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



20122

Mini Hand Drill Set

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

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



20113

Stainless Steel Jet Reamers

A great tool for cleaning detector jets or removing stuck ferrules from other small orifices. Serrated design is optimal for removing silica deposits and other contaminants.

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

Pocket Magnifier

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



20124

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

GC Oven Thermometer

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

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



22066

Flashlight with Swivel Head

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



22187

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

Septum Puller

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



Remove septum without damaging an expensive weldment.



Dislodge a stuck ferrule quickly and easily—without scoring the fitting.



20117

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



save **money!**

You can save money on column installation tools by purchasing the MLE Capillary Tool Kits described on **page 276**.

Septum Nut Removal Tool

for Agilent 5890/6890/6850/7890 GCs

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

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24918



Slip tool over septum nut...



loosen nut...



and remove, avoiding hot metal surfaces.



Septum nut remains in tool until reinstalled.

DescriptionSeptum Nut Removal Tool
for Agilent 5890/6890/6850/7890 GCs

qty.	cat.#	price
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.

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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.

DescriptionLiner Cap Removing Tool
for Thermo Scientific GCs**Similar to TS**

part #	qty.	cat.#	price
205 070 10	ea.	24937	



Q-sep™

Complete Product Offering

to support AOAC (2007.01)
& European (EN 15662)
QuEChERS Methods

- Comprehensive portfolio of QuEChERS tubes.
- Method-specific internal and QC standards.
- Rxi®-5Sil MS Capillary column
- Ultra Aqueous C18 LC Column.
- Q-sep™ 3000 Centrifuge

www.restek.com/quechers

i 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



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		10-pk.	22213	20233	20275
0.4mm	0.10/0.15/0.18/0.25/0.28mm	10-pk.	22214	20200	20211
0.4mm	0.10/0.15/0.18/0.25/0.28mm	50-pk.	—	20227	20229
0.5mm	0.32mm	10-pk.	22215	20201	20212
0.5mm	0.32mm	50-pk.	—	20228	20231
0.6mm	0.28mm**	10-pk.	—	—	20232
0.8mm	0.45/0.53mm	10-pk.	22216	20202	20213
0.8mm	0.45/0.53mm	50-pk.	—	20224	20230
1.0mm	0.75mm*	10-pk.	22217	21058	24912
1.2mm	0.75mm*	10-pk.	22218	—	—
1.6mm	1.00mm*	10-pk.	—	21060	—

Encapsulated Ferrules

for 1/16-Inch Compression Fittings

- Reusable—will not deform and stick in fittings.
- Less torque needed to seal ferrule.
- Restek's unique blend of graphite minimizes fragmentation and outgassing.

Ferrule ID	Fits Column ID	qty.	cat.#	price
0.4mm	0.25mm	10-pk.	21036	
0.5mm	0.32mm	10-pk.	21037	
0.8mm	0.53mm	10-pk.	21038	

Compact Ferrules

for Agilent 5890/6890/6850/7890 GCs

Available in graphite or 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	—
1.6mm	1.00mm*	10-pk.	21061	—

*For micropacked columns.

**For 0.28 mm MXT columns.

Standard Ferrulesfor $\frac{1}{16}$ -, $\frac{1}{8}$ -, and $\frac{1}{4}$ -Inch Fittings

Available in Vespel®, graphite, or Vespel®/graphite.

Fitting Size	Ferrule ID	qty.	Vespel	Graphite	Vespel/Graphite
$\frac{1}{4}$ "	$\frac{3}{16}$ "	5-pk.	—	—	20258
$\frac{1}{16}$ "	$\frac{1}{16}$ "	10-pk.	22210	20207	20218
$\frac{1}{8}$ "	$\frac{1}{8}$ "	10-pk.	22211	20208	20219
$\frac{1}{8}$ "	reduce to $\frac{1}{16}$ "	10-pk.	—	20209	20220
$\frac{1}{4}$ "	$\frac{1}{4}$ "	10-pk.	22212	20210	20221
$\frac{1}{4}$ "	reduce to $\frac{1}{8}$ "	10-pk.	22219	20225	20222
$\frac{1}{4}$ "	reduce to $\frac{1}{16}$ "	10-pk.	—	20226	20223

**Two-Hole Ferrules**for $\frac{1}{8}$ -Inch and $\frac{1}{16}$ -Inch Compression-Type Fittings

Fitting Size	Ferrule ID	Fits Column ID	qty.	Vespel/Graphite
$\frac{1}{16}$ "	0.4mm	0.25/0.28mm	5-pk.	24848
$\frac{1}{16}$ "	0.5mm	0.32mm	5-pk.	24849
$\frac{1}{8}$ "	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
$\frac{1}{8}$ "	0.4mm	0.25mm	5-pk.	20205	20254
$\frac{1}{8}$ "	0.5mm	0.32mm	5-pk.	20205	20255
$\frac{1}{8}$ "	0.8mm	0.53mm	5-pk.	20206	20215
$\frac{1}{4}$ "	0.4mm	0.25mm	5-pk.	20203	—
$\frac{1}{4}$ "	0.5mm	0.32mm	5-pk.	20203	20257
$\frac{1}{4}$ "	0.8mm	0.45/0.53mm	5-pk.	20204	20217

**Blank Ferrules**for $\frac{1}{16}$ -Inch Fittings

Fitting Size	Ferrule ID	qty.	Vespel/Graphite
$\frac{1}{16}$ "	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 $\frac{1}{16}$ " 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.



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**Alumaseal®
Ferrules**

- Will not crack or fragment.
- Excellent for GC/MS.

Ferrules

**Teflon® Ferrules**

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

Fitting Size	Ferrule ID	qty.	cat.#	price
1/16"	1/16"	10-pk.	21122	
1/16"	0.4mm	10-pk.	21123	
1/16"	0.5mm	10-pk.	21124	
1/16"	0.8mm	10-pk.	21125	
1/8"	1/8"	10-pk.	21126	
3/16"	3/16"	10-pk.	21127	
1/4"	1/4"	10-pk.	21128	

Graphite Ferrules

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

- Preconditioned to eliminate out-gassing.
- High-purity, high-density graphite.
- Smoother surface and cleaner edges than conventional graphite ferrules.
- Contain no binders that can off-gas or adsorb analytes.
- Stable to 450 °C.

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

5 mm Ferrules

for Shimadzu 17A GCs

- For use with packed columns.
- Graphite construction.

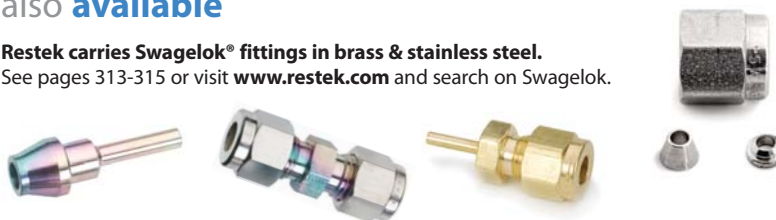
Description	qty.	cat.#	price
5mm Ferrules for Shimadzu 17A GCs	10-pk.	21121	

Graphite Ferrules

for Shimadzu 17A, 2010, & 2014 GCs

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

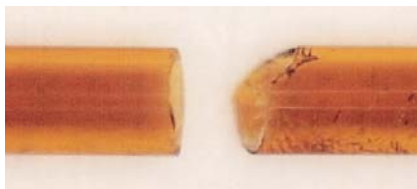
Ferrule ID	Fits Column ID	Similar to Shimadzu part #	qty.	cat.#	price
0.4mm	0.25mm and less	220-90765-00	10-pk.	24827	
0.5mm	0.32mm	221-32126-05	10-pk.	24828	
0.8mm	0.53mm	221-32126-08	10-pk.	24829	

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

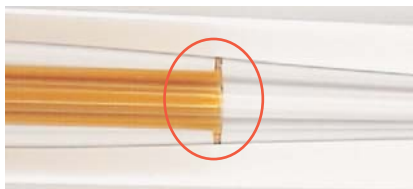
Restek Press-Tight® Connectors

Press-Tight® connectors are lightweight, quickly installed, and easy to use. They connect fused silica tubing having outside diameters ranging from 0.33 to 0.74 mm (Restek 0.1 to 0.53 mm ID). Press-Tight® connectors do not cause solvent tailing, or adsorb active compounds.

Press-Tight® connectors most often are used to connect a guard column to an analytical column. They also are used to connect columns differing in polarity, for unique separations, or to repair a broken column.



Make a clean, square cut for optimum connector performance. The cut on the right will produce a poor seal.



A brown ring indicates a proper seal.

Obtaining a leak-tight seal:

To achieve optimum performance from these connectors, begin with a properly cut fused silica column or retention gap end. Even if you use polyimide resin (cat.# 20445, page 288) for extra insurance, a poorly cut capillary column will make an inadequate seal.

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

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

Press-Tight® connectors are effective at oven temperatures to 325 °C, the temperature at which the polyimide coating on the column decomposes and the connection will begin to leak. We strongly recommend using a Vu2 Union® (page 289) or SeCure® “Y” Connector (page 290) connector if oven temperatures will exceed 325 °C for prolonged periods of time.

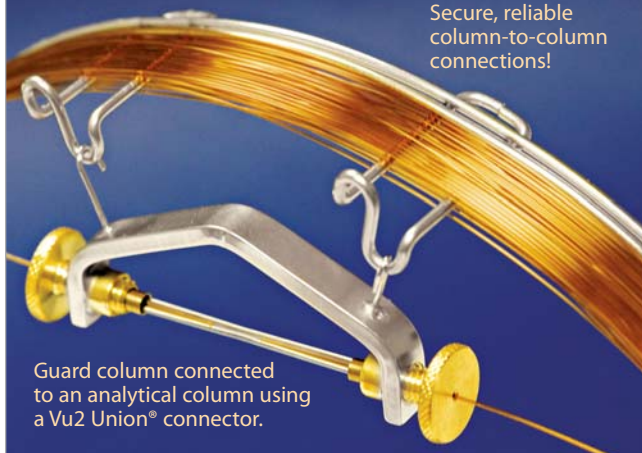
Can Press-Tight® connectors be used with MXT® columns?

No. To achieve a leak-tight fused silica to stainless steel connection, we recommend an MXT® connector (see page 292).

Turn the page for a complete list of Restek Press-Tight® Connectors.

**Let Restek Make the Connection!**

Secure, reliable column-to-column connections!



Guard column connected to an analytical column using a Vu2 Union® connector.

Restek will connect a guard column/transfer line to any analytical column, using a Vu2 Union® connector. We will leak-check the connection and confirm analytical integrity by analyzing a test mixture. To order a preconnected guard column/transfer line, add the three-digit suffix from the chart below to any analytical column catalog number. Example: A 5 m, 0.32 mm ID guard column connected to a 30 m, 0.32 mm ID, 1.0 µm Rtx®-5 column is cat.# 10254-163.

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

Guard columns listed are intermediate polarity (IP) deactivated.

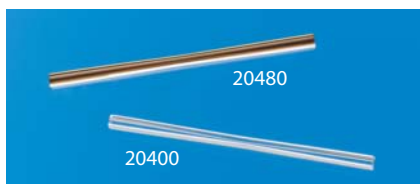
For more information about guard columns and other deactivations, see pages 31–35.

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



Press-Tight® Connectors

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



Universal Press-Tight® Connectors

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

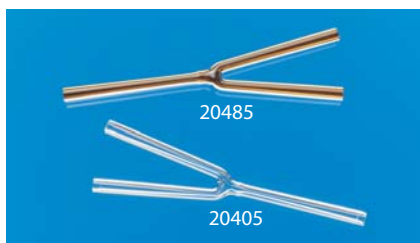
Description	5-pk./price	25-pk./price	100-pk./price
Universal Press-Tight Connectors	20400	20401	20402
Universal Press-Tight Connectors, Deactivated	20429	20430	
Universal Press-Tight Connectors, Siltek Treated	20480	20449	



Universal Angled Press-Tight® Connectors

- Ideal for connecting a guard column to an analytical column.
- Angle approximates the curvature of a capillary column, reduces strain on column-end connections.

Description	5-pk./price	25-pk./price	100-pk./price
Universal Angled Press-Tight Connectors	20446	20447	20448
Universal Angled Press-Tight Connectors, Deactivated	20446-261	20447-261	20448-261
Universal Angled Press-Tight Connectors, Siltek Treated	20482	20483	20484



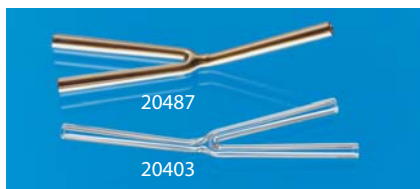
Universal “Y” Press-Tight® Connectors

An alternative method of performing dual-column confirmational analyses!

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

Description	ea./price	3-pk./price
Universal “Y” Press-Tight Connector	20405	20406
Universal “Y” Press-Tight Connector, Deactivated	20405-261	20406-261
Universal “Y” Press-Tight Connector, Siltek Treated	20485	20486

Single injection confirmational analyses!



Universal Angled “Y” Press-Tight® Connectors

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

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



Polyimide Resin

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

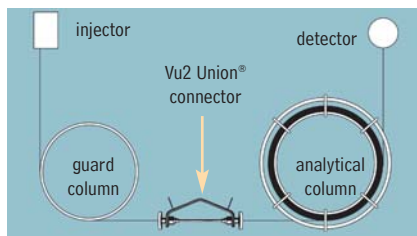
Description	Max. Temp.	qty.	cat.#	price
Polyimide Resin	350°C	5 grams	20445	

Vu2 Union® Connectors

- Connect a guard column to an analytical column.
- Connect a column to a transfer line.
- Connect two columns in series.
- Repair a broken column.
- Fit both Restek cage designs.

Restek's Vu2 Union® connector combines the simplicity of a Press-Tight® union with the strength of a metal union.

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



Fit both Restek cage designs.



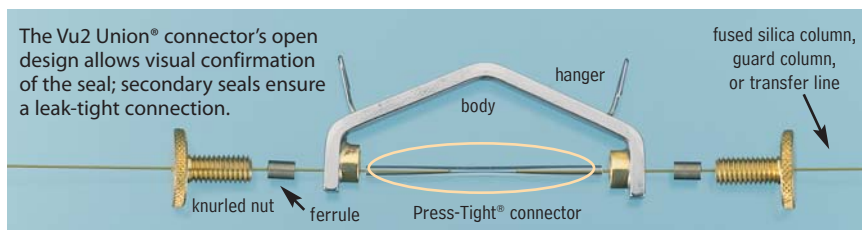
Patent pending.

How does a Vu2 Union® connector work?

A Press-Tight® union in the Vu2 Union® connector joins the fused silica ends together; the ferrule and knurled nut at each end of the connector hold the tubing in place via a secondary seal between the ferrule and the Press-Tight® union. Each knurled nut applies independent pressure to each ferrule, to make a leak-tight seal with the column end. These ultra-strong connections will not unexpectedly disconnect under temperature changes, vibrations, or other stresses normally encountered in GC analyses. The open design allows visual confirmation of the seal between the column and the Press-Tight® union, to ensure confidence in the connection. Hang the connector from the column cage, to minimize stress on the connections.

Who will benefit from using Vu2 Union® connectors?

Any analyst using guard columns, transfer lines, or restrictor tubing, performing a dual-column analysis with columns connected in series, or seeking to repair a broken column will find Vu2 Union® connectors the simple, reliable, easy-to-use solution to their connection needs.



Secure, reliable
column-to-column
connections!

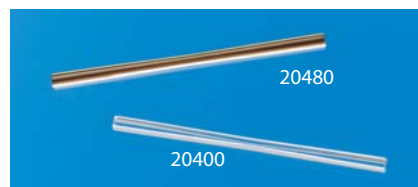
NOTE: This product is not recommended for GC column-to-MS connections—use the Vacuum Vu-Union®. See page 291.

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

Description	Ferrules Fit Column ID	qty.	cat.#	price
Vu2 Union Connector Kit	0.10/0.15mm	kit	22220	
Vu2 Union Connector Kit	0.18/0.28mm	kit	21105	
Vu2 Union Connector Kit	0.32mm	kit	21106	
Vu2 Union Connector Kit	0.45/0.53mm	kit	21107	
Knurled nut		2-pk.	21108	

Universal Press-Tight® Connectors

Description	5-pk./price	25-pk./price	100-pk./price
Universal Press-Tight Connectors	20400 \$49.50	20401 \$198	20402
Universal Press-Tight Connectors, Deactivated	20429 \$57.50	20430 \$228	
Universal Press-Tight Connectors, Siltek Treated	20480 \$62	20449 \$259	

**Graphite Ferrules**

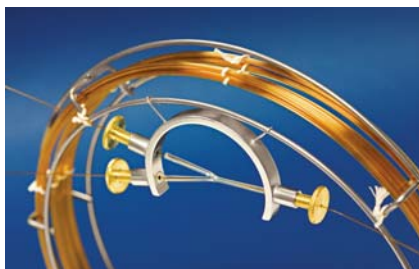
for Vu2 Union® Connectors

- High-purity, high-density graphite.
- Stable to 450 °C.
- No binders that can off-gas or adsorb analytes.
- Smooth surface and clean edges.

Ferrule ID	Fits Column ID	Graphite 2-pk./price	Graphite 10-pk./price
0.3mm	0.10/0.15mm	22221 \$23	22222
0.4mm	0.18/0.28mm	20280 \$23	20281
0.5mm	0.32mm	20282 \$23	20283
0.8mm	0.45/0.53mm	20284 \$23	20285



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Fit both Restek cage designs.



Patent pending.

Secure, reliable
column-to-column
connections!

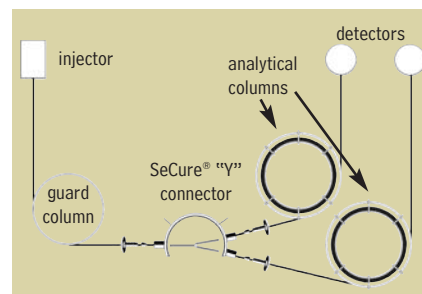
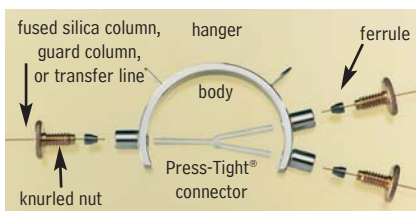
SeCure® "Y" Connector Kits

- 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.
- 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.



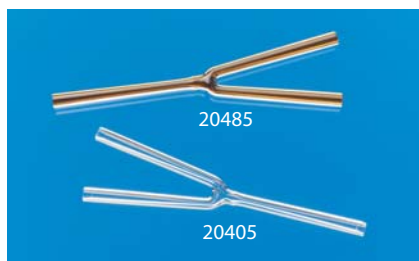
Kits include: SeCure® "Y" connector body, 3 knurled nuts, "Y" Universal Press-Tight® union, 3 ferrules.

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

An alternative method of performing dual-column confirmational analyses!

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



Description	ea./price	3-pk./price
Universal "Y" Press-Tight Connector	20405 \$78	20406
Universal "Y" Press-Tight Connector, Deactivated	20405-261 \$79	20406-261
Universal "Y" Press-Tight Connector, Siltek Treated	20485 \$80.50	20486

Graphite Ferrules

for SeCure® "Y" Connectors

- Preconditioned to minimize out-gassing.
- High-purity, high-density graphite.
- Stable to 450 °C.
- No binders that can off-gas or adsorb analytes.
- Smooth surface and clean edges.



Ferrule ID	Fits Column ID	Graphite 10-pk./price	Graphite 50-pk./price
0.4mm	0.10/0.15/0.18/0.25/0.28mm	20200 \$32	20227
0.5mm	0.32mm	20201 \$32	20228
0.8mm	0.45/0.53mm	20202 \$32	20224



20427

Vacuum Vu-Union® Connector for GC/MS Applications

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

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

Vu-Union® Helping Hand

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



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



20422

Vu-Union® Vespel®/Graphite Ferrules

- Use with Vacuum Vu-Union® connectors.
- 60% Vespel®/40% graphite.
- 400 °C maximum operating temperature.

Ferrule ID	Fits Column	qty.	cat.#	price
0.3mm	< 0.22mm ID/ < 0.4mm OD	10-pk.	20423	
0.4mm	0.25mm ID/0.4mm OD	10-pk.	20420	
0.5mm	0.32mm ID/0.5mm OD	10-pk.	20421	
0.8mm	0.45/0.53mm ID/0.8mm OD	10-pk.	20422	

**Coupling GC Columns**

An MXT® connector is a good alternative to a glass connector when coupling GC columns. This connector is constructed from stainless steel and will not break; it uses ferrules for sealing. The design ensures low dead volume, and Siltek® treatment ensures the MXT® connector is inert—both features help minimize peak tailing. MXT® connectors can be used to connect metal-to-metal, metal-to-fused silica, or fused silica-to-fused silica tubing. When connecting metal tubing, use 1/32-inch stainless steel ferrules (listed above); for fused silica tubing, use Valcon polyimide adaptor ferrules (see page 292).



20272



20270

Gerstel GRAPHPACK® 3D/2 Connectors & Ferrules

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

Gerstel GRAPHPACK® 3D/2 Connectors

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

GRAPHPACK® 3D/2 Ferrules

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

*Use only with GRAPHPACK 3D/2 ferrules.

GRAPHPACK® 2m Ferrules

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



20146

Ferrule Removal Kit

The tapered tools in this kit have teeth designed to grip and remove fused silica adaptor ferrules that have become stuck in the fitting detail. Each kit has two tools: one for removing 1/32-inch adaptor ferrules and one for removing 1/16-inch adaptor ferrules.

Description	Valco #	qty.	cat.#	price
Ferrule Removal Kit	FRK1	kit	20146	



20388

1/4-Inch–3/16-Inch Open-End Wrenches

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

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

MXT®-Union Connector Kits for Fused Silica Columns

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

These MXT® connectors can be used with fused silica tubing, because of a Valcon polyimide 1/32-inch one-piece fused silica adaptor. This unique graphite-reinforced composite allows a capillary column to slide into the adaptor and be locked in place simply by loosening and tightening the fitting.

MXT®-Union Connector Kits for Fused Silica Columns

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



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

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

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



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



Adaptor Ferrules



20389

1/32-Inch Valco® Adaptor Ferrules (Valcon Polyimide)

Fused silica adaptor ferrules are Valcon polyimide, a unique graphite-reinforced composite, specially prepared to maximize mechanical stability at temperatures to 350 °C. The determining factor for selecting adaptor ferrule size is the fused silica tubing OD.

Tubing OD	Tubing ID	Valco #	qty.	cat.#	price
0.25 ≤ 0.40mm	0.25mm	FS.4-5	5-pk.	20137	
0.40 ≤ 0.50mm	0.32mm	FS.5-5	5-pk.	20140	
0.50 ≤ 0.80mm	0.53mm	ZF.5V-5	5-pk.	20141	
1/2" Replacement Nut			5-pk.	20389	

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

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

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

- Connect a guard column/transfer line to an MXT® stainless steel column.
- Low thermal mass tracks rapid oven temperature programming.
- Stainless steel ferrules and nuts.
- Available in “Y” and union configurations.
- Siltek® treatment ensures ultimate inertness.



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

Description	qty.	cat.#	price
For 0.28mm ID MXT Columns	kit	20397	
For 0.32mm ID MXT Columns	kit	20536	
For 0.53mm ID MXT Columns	kit	20394	

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

Connect two MXT® columns to one inlet or one MXT® column to two detectors.



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

Description	qty.	cat.#	price
For 0.28mm ID MXT Columns	kit	20396	
For 0.32mm ID MXT Columns	kit	20537	
For 0.53mm ID MXT Columns	kit	20395	

Replacement Ferrules (1/32-Inch Stainless Steel) for MXT® Connectors



Ferrule ID	Fits Column ID	qty.	cat.#	price
0.59mm	0.28mm	10-pk.	20398	
0.53mm	0.32mm	10-pk.	20535	
0.79mm	0.53mm	10-pk.	20399	

**Zero-Dead-Volume Valco® Internal Union**

Ends of tubing seat squarely at bottoms of fitting details. 300 series stainless steel. For 1/16" OD tubing. Stainless steel ferrules included.

Description	Union Bore	Valco #	qty.	cat.#	price
Internal Union	0.15mm	ZU1XC	ea.	20147	
Internal Union	0.25mm	ZU1C	ea.	20148	
Internal Union	0.75mm	ZU1	ea.	20149	
Internal Union	1/16"	ZU1T	ea.	20150	

**Zero-Dead-Volume Valco® Internal Reducing Union**

Connect two sizes of tubing, using zero-dead-volume fittings on each end. For 1/8" to 1/16" OD tubing. Stainless steel ferrules included.

Description	Union Bore	Valco #	qty.	cat.#	price
Internal Reducing Union	0.25mm	ZRU21C	ea.	20151	
Internal Reducing Union	0.75mm	ZRU21	ea.	20152	
Internal Reducing Union	1/16"	ZRU21T	ea.	20153	

**Zero-Dead-Volume Valco® Internal Tee**

Connect three lines. 300 series stainless steel; stainless steel ferrules included. For 1/16" OD tubing.

Description	Union Bore	Valco #	qty.	cat.#	price
Internal Tee	0.25mm	ZT1C	ea.	20154	
Internal Tee	0.75mm	ZT1	ea.	20155	

**Zero-Dead-Volume Valco® Internal Cross**

Connect four lines. 300 series stainless steel; stainless steel ferrules included. For 1/16" OD tubing.

Description	Union Bore	Valco #	qty.	cat.#	price
Internal Cross	0.25mm	ZX1C	ea.	20156	
Internal Cross	0.75mm	ZX1	ea.	20157	

**Male Pipe to Valco® Internal Adapter**

Makes a minimum volume connection from a female pipe fitting on a pressure gauge or regulator to a Valco® zero-dead-volume fitting. 300 series stainless steel; stainless steel ferrules included.

Description	Fitting Size	Bore	Valco #	qty.	cat.#	price
Male Pipe to Valco	1/4" NPT Male					
Internal Adapter	to 1/16" ZDV	1.0mm	PZA21	ea.	20158	
Male Pipe to Valco	1/4" NPT Male					
Internal Adapter	to 1/16" ZDV	1.0mm	PZA41	ea.	20159	

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

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

**1/16-Inch Valco® Adaptor Ferrules**

Tubing OD	Tubing ID	Valco #	qty.	Valcon Polyimide		Polyimide	
				cat.#	price	cat.#	price
0.25–0.4mm	0.1–0.25mm	FS1.4-5	5-pk.	20142		2-pk.	21015
0.4–0.5mm	0.32mm	FS1.5-5	5-pk.	20143		2-pk.	21016
0.5–0.8mm	0.53mm	FS1.8-5	5-pk.	20144		—	—
0.8mm (1/32")	—	FS1.9-5	5-pk.	20145		—	—

also available**Treated Fittings!**

See pages 313-317 for our Siltek®/Sulfinert® treated and Silcosteel®-CR treated fittings, as well as many more brass and stainless steel fittings from Swagelok® and Parker®.

