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

**All kits include these components:**
- $^1/_8$", $^3/_{16}$", $^1/_4$" nylon brushes
- $^1/_4$", $^3/_8$", $^3/_{16}$" stainless steel wire tube brushes
- stainless steel surface brush
- 6 stainless steel jet reamers (0.25–0.65mm OD)
- $^1/_4$" x $^5/_{16}$" open end wrench
- $^3/_8$" x $^7/_{16}$" open end wrench
- rubber-tipped slide-lock tweezers
- scoring wafers with handles
- inlet liner removal tool
- septum puller
- mini wool puller/inserter 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)

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)

**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
- $^7/_{16}$" x $^1/_2$" open end wrench
- $^1/_2$" x $^9/_{16}$" open end wrench

**MLE Capillary Tool Kit for PerkinElmer GCs (cat.# 22185) also includes:**
- $^7/_{16}$" x $^1/_2$" open end wrench
- $^1/_2$" x $^9/_{16}$" 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
- $^7/_{16}$" x $^1/_2$" open end wrench
- $^1/_2$" x $^9/_{16}$" open end wrench

| 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!

# Column Installation Tools

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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 | qty. | cat.# |
| --- | --- | --- |
| Scoring Wafer with Handle | 2-pk. | 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 | qty. | cat.# |
| --- | --- | --- |
| Ceramic Scoring Wafers | 5-pk. | 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 | qty. | cat.# |
| --- | --- | --- |
| Sapphire Scribe | ea. | 20182 |

## Shortix® Capillary GC Column Cutter

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

cat.# 23027

cat.# 23026

| Description | qty. | cat.# |
| --- | --- | --- |
| 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 |

## 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 | qty. | cat.# |
| --- | --- | --- |
| Capillary Column Caps | 10-pk. | 21044 |

## Capillary Installation Gauge

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

restek
**innovation!**

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.

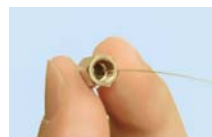## Capillary Installation Gauge for Agilent 5973/5975 MS

- 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 |

# Column Installation Tools

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

**No more burned fingers!**

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.# |
|---|---|---|
| Inlet Liner Removal Tool | 3-pk. | 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 | qty. | cat.# |
|---|---|---|
| Inlet Liner Packing Tool | ea. | 20339 |

## Mini Wool Puller/Inserter

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

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

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.

**damaged threads**

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 | qty. | cat.# |
|---|---|---|
| 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.
- 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.# |
|---|---|---|
| $1/4$" 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.# |
|---|---|---|
| Open-End Wrench Set | set | 20387 |

## Open-End Wrenches
High-quality wrenches for tightening capillary fittings.

| Description | qty. | cat.# |
|---|---|---|
| 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 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", $1/16$", $5/64$", $3/32$", $7/64$", $1/8$", $9/64$", $5/32$", $3/16$", $7/32$", $1/4$", and $5/16$".

| Description | qty. | cat.# |
|---|---|---|
| 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 ($^3/_8$-, $^3/_{16}$-, 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.# |
|---|---|---|
| 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 $^1/_8$-, $^3/_{16}$-, and $^1/_4$-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).

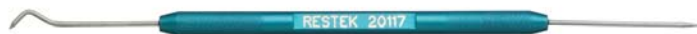| Description | qty. | cat.# |
|---|---|---|
| Flashlight with Swivel Head | ea. | 22187 |

## 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 |

### restek **innovation**!

## 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 |

# GC Inlet and FID Maintenance Kits

**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

also **available**

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

**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.

**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 |