



Capillary Column Installation



Column
Installation
Tools

Tool Kits

Flow Meters

Septa . . .
Thermolite
Septa
Red-Lite Septa

Ferrules

Microflame
Torch

Rinsing
Reservoir

Methane
Cylinder

“A Guide to GC Set-up”
- ask for this free Restek publication

ALSO ! Look fir it on this Website

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**A Guide to GC Set-up:**

Request this technical guide for pre-installation instructions, lists of tools required to plumb a GC, and information on choosing the proper GC gases, plumbing gases to the GC., GC gas purification, leak checking, and creating an instrument logbook. Capillary chromatography accessories for GC set-up are also listed in this free guide.

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■ Restek's Capillary Column Installation Video

Our Capillary Column Installation video is an ideal training tool for all chromatographers! Refer to page 313 of the Educational Materials section in this catalog for more information.

■ Leak Detectors

Leaks in a GC system can cause a wide range of problems for analysts. Electronic leak detectors allow analysts to detect minute gas leaks undetected by liquid leak detectors without risk of contamination. They are an absolute necessity with capillary GC! For descriptions of available Leak Detectors, please refer to pages 234-235 of this catalog.

■ Microflame™ Torch -The best way to seal capillary column ends!

Proper storage of a capillary column will increase its lifetime. Flame-sealing the column ends is the most effective way to prevent oxygen and moisture from entering the column and damaging the stationary phase. The Microflame™ Torch kit comes complete with everything you will need: a miniature Microflame™ Torch, one butane cylinder, one micronox cylinder, flame tip, and instructions.

If the torch will not light after installing a new cylinder, the piercing knob tip may have broken off and will need to be replaced. The Microflame3M Torch rebuild kit contains one micronox piercing knob, one butane piercing knob, and two cylinder gaskets.

Microflame™ Torch Kit: cat.# 20125, ea.

Rebuild Kit: cat.# 20128, ea.

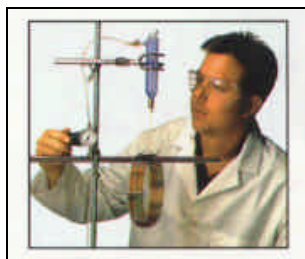
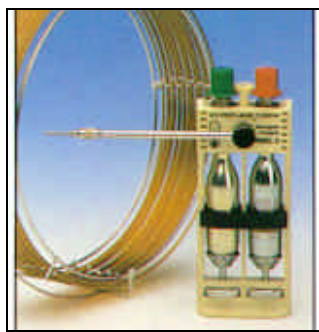
Please note: You should order spare butane and micronox cylinders to keep your torch operating. Be sure to order extra micronox cylinders, because one butane cylinder will outlast three micronox cylinders.

Micronox cylinders: cat.# 20126, /4pk. / **Butane cylinders:** cat.# 20127, /2pk.

■ Capillary Column Rinsing Reservoir

Restore the performance of bonded-phase capillary columns by rinsing soluble, non-volatile residue using this reservoir. The 50ml volume reservoir includes a built-in frilled disk to prevent particulate matter from contaminating the column and is equipped with 1/4-inch inlet and outlet connections. The Rinsing Reservoir is available as a complete kit (containing the reservoir, pressure regulator, fittings, ferrules, and tubing) or is sold separately.

Complete Kit: cat.# 20612, /kit **Reservoir only:** cat.# 20613, ea.



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Methane Cylinder & Tool Kits

Methane Cylinder

Setting the column flow rate by injecting methane and optimizing linear velocity is the preferred method for establishing reproducible retention times (ASTM Method E1510-93). Measuring the linear velocity of your carrier gas is made easy by using the Scotty II cylinder containing 1% methane in helium. The complete kit comes with the Scotty II cylinder, a Minicyl regulator, a syringe adaptor, and a package of twenty septia.

Complete Kit: cat.# 20197, ea.

Replacement Septa: cat.# 20198, /20-pk.

Replacement Cylinder: cat.# 20199, ea.



The MLE Tool Kit

The MLE Tool Kit Includes:

- Rubber-tipped Slide-Lok tweezers
15cm compact steel ruler
Three ceramic scoring wafers
Pocket magnifier
Pin vise w/ three drills (0.41, 0.51, 0.8mm)
Four-inch tapered needle file
Six stainless steel jet reamers (0.25-0.65mm)
Five self-adhesive capillary column labels
Septum puller
Three nylon brushes (1/8/3/6, and 1/4-inch)
Pipe cleaner (one-foot)
1/4-5/16-inch wrench
One-meter of high temperature string (400°C)
Three stainless steel brushes (3/16, 1/4, and 3/8-inch)
Stainless steel surface brush



See pages 290-291 for complete descriptions of each tool included in the MLE kits

- Glass wool puller/inserter
Fused silica column installation guide
Capillary reference poster

MLE Tool Kit: cat.# 20118, ea.

The MLE Tool Kit: Conveniently provides the necessary tools for installing and maintaining capillary columns!

Note: By ordering the MLE Tool Kit, the price is more than 50% lower than if parts were ordered individually.

The Mini MLE Tool Kit

The Mini MLE Kit Includes:

- One ceramic scoring wafer
Pocket magnifier
15cm compact steel ruler
1/4-5/16-inch wrench
0.5 and 0.8mm ID graphite ferrules
Self-adhesive capillary column labels
Fused silica capillary column installation guide
Capillary reference poster

Mini MLE Tool Kit: cat.# 20119, ea.



The Mini MLE Tool Kit: This economically -priced kit contains the bare essentials for proper column installation



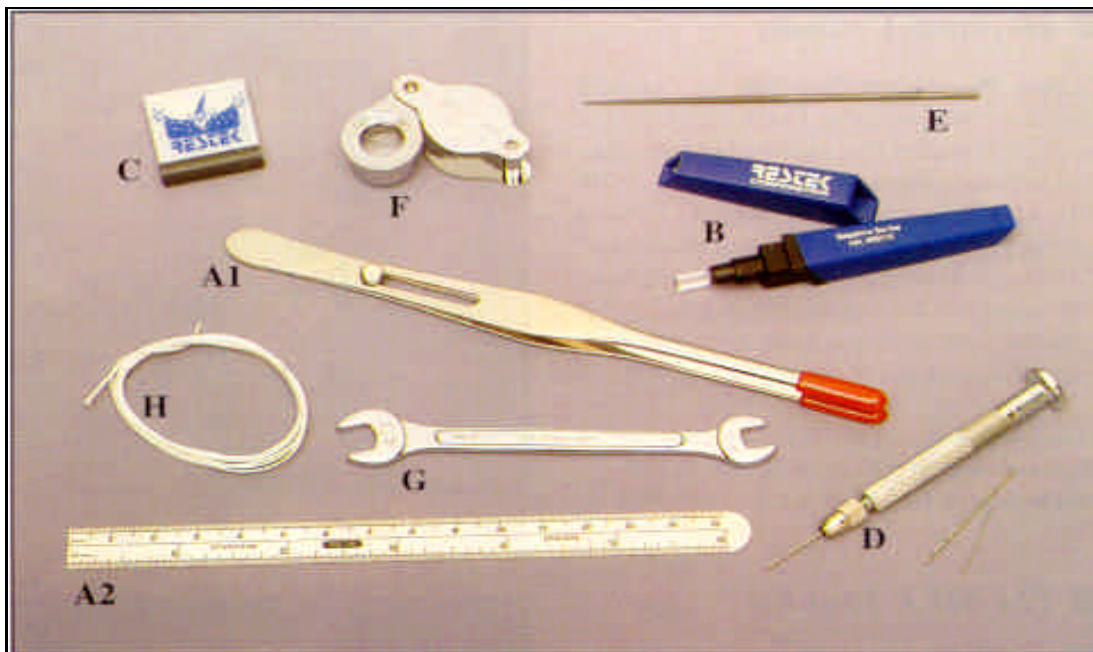
you can

**SAVE
MONEY**

by ordering the
complete tool kits
from page 289

A Tip From the Wizards

Order the Complete MLE
- Tool Kit or the Mini MLE
Tool Kit from Restek, and
pay 50% less than if
ordered individually.



■ A) Slide-Lok Tweezers and 15cm Compact Steel Ruler

This duo provides a convenient way to install capillary columns to the correct insertion distance recommended by the instrument manufacturer.
cat.# 20101, /set

■ B) Sapphire Scribe

The sapphire scribe is recommended for cutting fused silica tubing because it cuts the tubing squarely without leaving jagged edges. **cat.# 20115, ea.**

■ C) Ceramic Scoring Wafer

The scoring wafer is our most popular cutting tool. It has four straight scoring edges for cutting fused silica tubing and four serrated edges for cutting MXT-metal capillary columns. A Sure Grip handle is included.
cat.# 20116, /5pk.

■ D) Pit, Vise and Drill Bits

This tool set comes with three different drill sizes for use with 0.25, 0.32, and 0.53mm ID (0.4, 0.5, and 0.8mm OD) capillary columns. Drill ferrules to the proper size in seconds!

Pin vise and drill bits: cat.# 20103, /set

Replacement drills: cat.# 20111, /2 sets

■ E) 4" Tapered Needle File

This file can be used for a multitude of purposes and is especially useful for removing ferrules that are lodged in injector or detector ports.
cat.# 20106, /2pk

■ E) Pocket Magnifier

This magnifier is small and easy to handle. The 10X magnification makes it easy to see the column ends to verify a square cut.
cat.# 20124, ea.

■ G) 1/4-5/16-inch Open End Wrench

We examined a lot of different wrenches before we decided to offer this high-quality wrench for tightening capillary fittings.
cat.# 20110, /2pk.

■ H) High Temperature String

This string, capable of withstanding temperatures to 400°C, is used to restring capillary columns, attach column connectors to column cages, or hold the column in the GC oven.
cat.# 20109, /10-meters
cat.# 20618, /450-meters

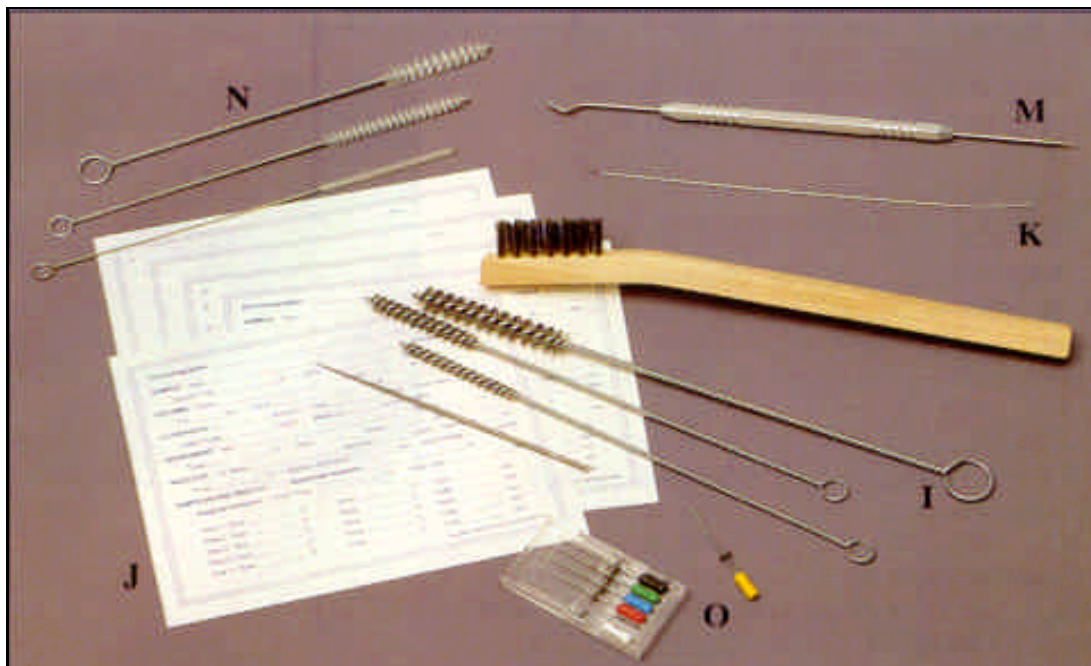
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you can
SAVE MONEY
by ordering the
complete tool kits
from page 289

■ **I) Surface Brush**

Stainless steel tube brushes (1/8, 3/8 and 1/4-inch) work well for cleaning dirty collectors, injector, and detector ports. Unlike a brass brush that can leave a metal residue, the surface brush can be used to remove residue that builds up on metal detector jets and electronic contacts.
cat.# 20112, /4pk.

■ **J) Capillary Gas Chromatogram Labels**

These labels are an excellent way to quickly document all the necessary information for a capillary gas chromatography analysis.
eat.# 20630, /100pk.

■ **K) Mini Wool Puller/Inserter**

This tool is used for both inserting and removing glass or fused silica wool from injection port liners. The small design is especially useful for Uniliner sleeves and for other injection port liners as small as 0.8mm ID.
cat.# 20114, /2pk.

MXT Needle Files **NEW**

(not shown)

This multi-purpose file is especially useful for cutting Silcosteel~ (metal) columns.

cat.# 21601, /2-pack

■ **M) Septum Puller**

This versatile tool is great to keep on hand in your laboratory because it can be used in so many different ways. The hooked end can be used for removing septia and o-rings. The sharp, pointed end works well for removing stuck ferrule fragments.
cat.# 20117, ea.

■ **N) Nylon Tube Brushes and Pipe Cleaner**

Used for removing small septa fragments and residue from dirty glass inlet liners. Available in a set of three brushes (1/8, 3/16, and 1/4-inch) and a pipe cleaner.
cat.# 20108, /set

■ **O) Stainless Steel Jet Reamers**

A trip to the dentist for a root canal resulted in a great tool for cleaning detector jets and other small orifices. Serrated design is optimal for removing silica deposits and other contaminants.
cat.# 20113, /6pk.

■ **Open End Wrench Set** (not shown)

High-quality wrenches for tightening a wide variety of capillary fittings.
cat.# 20387, /set

A Tip from the Wizards

Order the Complete MLE Tool Kit or the Mini MLE Tool Kit from Restek and pay 50% less than if ordered individually.

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Restek's Veri-Flow 500 Electronic Flow

New Features

- Calculates linear velocity based on column ID.
- Includes standard RS 232 ComPort with printer function.
- Has auto zero function.
- Includes rechargeable battery pack and charger.

Additional Features

- Reads flow accurately to 500mL/min.
- Measures N₂, He, H₂, 5% Ar/Me, and Air. Measures split flow and mass flow.
- Has pulse free operation that will not interfere with EPCs.
- Includes auto "off" battery saver, NIST traceable calibration certificate, and capillary column adaptor.

Electronic Flow Meter (110v): cat.# 21643, each

Electronic Flow Meter (220v): cat.# 21645, each



Restek's MicroFlow 20 Flow Meter

- Linear velocity measured based on column ID.
- Linear flow range from 0.05 to 20ml/min. (He).
- NIST traceable for He and H₂.
- Manual zero function.
- Battery-operated for easy portability.
- Capillary column adaptor.



Digital Flow Calibrator

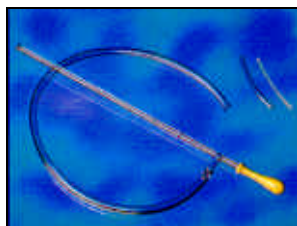
- Calibrated against NIST standards
- Easy readout with large LED display
- Use with all chromatography gases
- Battery-operated for portability

Designed to measure and calibrate gas flows used in capillary chromatography, the Digital Flow Calibrator is capable of measuring 0.5-500cc/min. flow rates accurately, regardless of the gas type. It is an excellent tool for measuring split vent and detector gas flows. It is also capable of displaying the split ratio.

Digital Flow Calibrator: cat.# 20123, each

Replacement Glass Burette: cat.# 21602, each

Soap Film Bubble Flow Meters



Restek offers two different sizes of bubble flow meters for measurement of column, makeup, and detector gas flow. The 1ml flow meter measures flows between 0.1 and 10cc/min. The 50ml flow meter is designed for flows between 10 and 300cc/min.

Both flow meters come with a reservoir bulb, twenty-four inches of 1/4-inch ID tubing, adaptor tubes for 1/8-inch tubing and 0.53mm ID capillary columns, and Velcro fasteners.

1ml Bubble Flow Meter: cat.# 20135, each

50ml Bubble Flow Meter: 20136, each

1ml Bubble Flow Meter

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Septa

What is septum bleed ?

Septum bleed results in baseline rise and extraneous peaks not caused by the sample or column. This problem is most prevalent in temperature-programmed analyses because volatiles from the septum collect on the column during the oven-cool-down and initial-hold periods. These volatiles then elute during the next programmed run (Figure 1).

Why is it important to use low bleed septa?

The high-resolving power of capillary columns magnifies septum bleed by producing sharp ghost peaks, which make component identifications very difficult. In addition, capillary columns operate at low flow rates, making septa bleed more pronounced. Using low-bleed septa can minimize these effects.

What about puncturability?

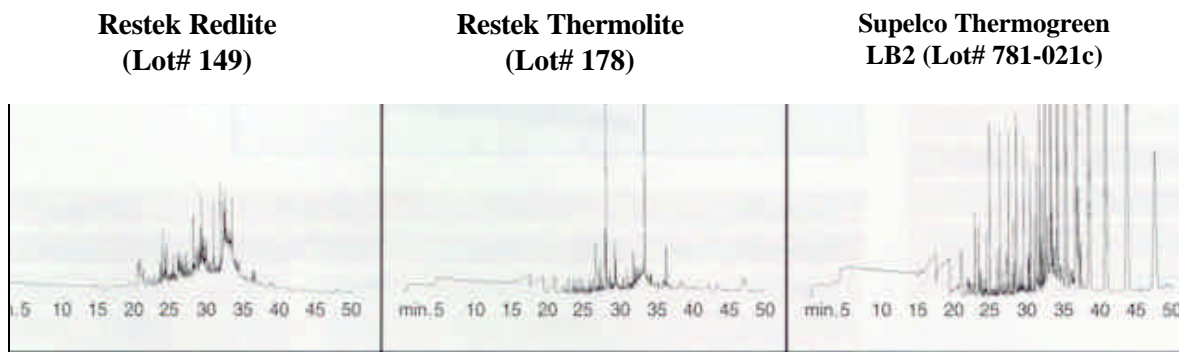
Restek's RedLite and Thermolite septa are manufactured from a soft, high-temperature silicone rubber that makes them easy to penetrate. Because of their high tear strength, RedLite™ septa are easy to puncture, do not exhibit tearing and fragmentation, and reduce needle coring which is the cause of septa particle accumulation.

RedLite and Thermolite septa will not stick to metal injector parts even at temperatures as high as 340°C. Because they are soft, the chance for syringe needle bending is also significantly reduced.

Ask for . . . a FREE copy of Restek's recently revised Technical Bulletin, A Guide to Minimizing Septa Problems,

Figure 1. FID Bleed - Regardless of the variables.

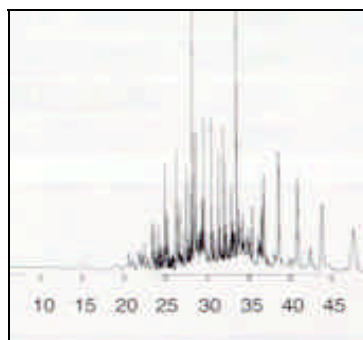
Restek's Thermolite and Redlite septa are the low bleed champions



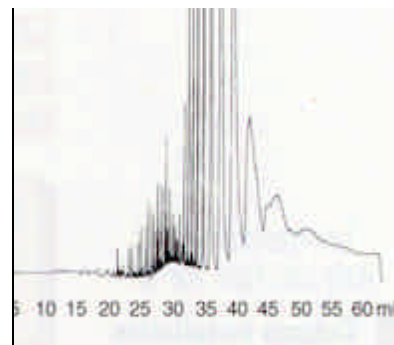
Baxter Septa 77 (Lot #0081)

Septa Bleed Comparison

Chromacol Chromaseal 9001 HT Septa



Oven temp.: 40°C (15 min.) to 300°C @ 15°C/min. (hold 40 min.)
Inj./det. temp.: 250°C/300°C
Carrier gas: hydrogen
Linear velocity: 40cm/sec.
Splitless hold time: 15 min.
Split vent: 40 ml/min,
Septum purge: 3.5 ml/min,
FID range: 5
15m, 0.53mm ID, 1.0,um Rtx-5 (cat.# 10252)



Test Procedure: A uniform piece was cut from the center face of each septum type and installed into a clean splitless sleeve. The injection port was heated to 250C for 15 min. then off.

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Thermolite & RedLite Septa

■ Thermolite & RedLite Low-Bleed Septa

- Lowest bleed on FIDs, ECDs, and MSDs.
- Each batch is tested to ensure lowest bleed.
- Excellent puncturability.
- Preconditioned and ready to use.
- Do not adhere to hot metal surfaces.
- Usable to 340°C inlet temperatures.
- Packaged in non-containing tins.

■ Which septa should I use?

Both Thermolite~ and RedLite'~ septa have the lowest bleed of any septa on the market. RedLite'M is slightly softer and offers better puncturability, in addition less fragmentation in the inlet liner. No matter which septa you choose both are excellent choices and the best in the market.

■ Thermolite Septa



Don't miss this great offer! Receive a **FREE** coffee mug, stein, or pen/pencil set with the purchase of Restek's **Thermolite Septa**

Septum	Instrument	Size
Hewlett-Packard		
	5890/6890	10/11mm
	5700/5880	9.5/10mm
Varian		
	packed column	9.5/10mm
	Split/splitless	10/11mm
Perkin-Elmer		
	Sigma series	11mm
	900/990	11mm
	8000 series	11mm
	Autosys	11mm
Tracor		
	550/560	9.5mm
	220/222	12.5mm
Gow-Mac		
	(all models)	9.5mm
Fisons/CarloErba		
		17mm
Pye Unicam		
		7mm
Finnigan		
	9001	9.5mm
	QCQ	9.5mm

Thermolite	25-pack	50-pack	100-pack
Septum Diameter	Free coffee mug	Free Stein	Free Pen/Pencil Set
5mm (3/16")	20351	20352	20353
6mm (1/4")	20355	20356	20357
7mm	20381	20382	20383
9.5mm (3/8")	20359	20360	20361
10mm	20378	20379	20380
11mm	20363	20364	20365
12.5mm (1/2")	20367	20368	20369
17mm	20384	20385	20386
Shimadzu Plug	20372	20373	20374
8mm	20370	20371	-

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RedLite Septa



Free !

Once you try RedLite™ septa, you'll see the difference. We're even including free items with each RedLite septa purchase.

Order a 25-pack and you'll receive a wizard travel mug.

Purchase a 50pack and a wizard tote bag is yours.

And, order a 100-pack and we'll include a mini-mag flashlight with your purchase.

Don't miss receiving these free items!

RedLite Septum Diameter	25-pack Free travel mug	50-pack Free tote bag	100-pack Free mini-mag light
9.5mm	22300	22301	22302
10mm	22303	22304	22305
11mm	22306	22307	22308
12.5mm	22309	22310	22311
17mm	22312	22313	22313

Restek's recently revised 20-page technical bulletin,

A Guide to Minimizing Septa Problems, is now available. This guide shows bleed comparisons of commercially available septa by FID, ECD, and MSD; explains why septum bleed is such a problem with capillary columns; discusses variables affecting septum bleed; provides guidelines for septum troubleshooting and maintenance; and presents problems that can be mistaken for septum bleed.

Free Guide !

To receive a free copy of this informative brochure, please ask !

Also ! Now available on this Website

Rob Lindquist
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Sherry Sponsler
Applications
Chemist



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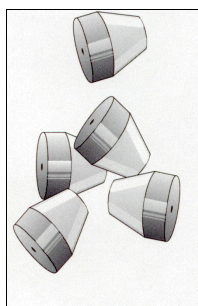


Ferrules

■ Ferrules

Restek offers graphite and Vespel/Graphite (60%/40%) ferrules to use with capillary columns. The graphite ferrules are made from highly compressed ribbon that will not crack or split under torque. The Vespel/Graphite ferrules are designed to seal easily with minimal torque, are reusable and are preferred for vacuum and high pressure uses. Both ferrule types are stable to 400C

Save Money Buy Ferrules in Bulk 50-packs



Capillary Ferrules for (1/16" compression type fittings)			
Ferrule ID	Fits Column ID	Graphite	Vespel/ Graphite
10-pack			
0.3mm	0.20mm	20233	
0.4mm	0.25mm	20200	20211
0.5	0.32mm	20201	20212
0.6mm	0.28mm		20232
0.8mm	0.53mm	20202	20213
50-pack			
0.4mm	0.25mm	20227	20229
0.5mm	0.32mm	20228	20231
0.8mm	0.53mm	20224	20230
Compact Ferrules for HP GCs for capillary injection ports			
Ferrule ID	Fits Column ID	Graphite 10-pack	Graphite 50-pack
0.4/0.5mm	0.25/0.32mm	20250	20251
0.8mm	0.53mm	20252	20253
Standard Ferrules for 1/16, 1/8, and 1/4" fittings			
Fitting Size	Ferrule ID	Graphite	Vespel/ Graphite
5-Pack			
1/4"	1/16"		20258
10-Pack			
1/16"	1/16"	20207	20218
1/8"	1/8"	20208	20219
1/8"	red to 1/16	20209	20220
1/4"	1/4"	20210	20221
1/4"	1/8"	20225	20222
1/4"	1/16"	20226	20223

Two-hole Ferrules (5-pack) (for 1/16" compression type fittings)			
Ferrule ID	Fits Column ID	Graphite	Vespel/ Graphite
0.4mm	0.25mm	20235	
0.5mm	0.32mm	20235	20242
Two-hole Ferrules (5-pack) (for 1/8" compression type fittings)			
0.8mm	0.53	20245	20246
Reducing Ferrules (5-Pack)			
1/8"	0.25mm	20205	20254
1/8"	0.32mm	20205	20255
1/8"	0.53mm	20206	20215
1/4"	0.25mm	20203	20256
1/4"	0.32mm	20203	20257
1/4"	0.53mm	20204	20217
Blank Ferrules (10-pack) (for 1/16" ferrules)			
Fitting Size	Ferrule ID	Graphite	Vespel/ Graphite
1/16"	No-hole"		20240
Graphite Ferrules for M4 Fittings *			
0.4mm	0.18-0.25mm	20280	20281
0.5mm	0.32mm	20282	20283
0.8mm	0.50 & 0.53mm	20284	20285
1/4"	1/8"	20225	20222
1/4"	1/16"	20226	20223

* 0.4mm ID ferrules is similar to Fisons part #290-13488, 0.5mm ID ferrule is similar to Fisons part#290-13487 and 0.8mm ID ferrule is similar to Fisons part#290-13486