

# GC Inlet Maintenance: Restek's Quick-Reference Guide

- Help ensure quality data by selecting the right GC inlet supplies.
- Prevent unwanted downtime with a preventative GC inlet maintenance program.
- Easily order the GC inlet supplies you need for your specific instrument.





## GC Inlet Maintenance: Restek's Quick-Reference Guide

Liners, septa, inlet seals... when compared to your analytical column, your instrument, or a customer lost due to missed deadlines or inaccurate data, these small consumables carry an almost nonexistent price. And yet, the impact they can have on your analysis—not to mention your livelihood—is huge: breakdown of active compounds, loss in response, and other performance issues. In extreme cases, improperly selected or poorly maintained inlet supplies can mean the difference between detecting your compounds or not.

With Restek's guidance and our comprehensive line of high-quality GC inlet supplies, performing proper GC inlet maintenance to help maximize your lab's uptime and ensure accurate, reproducible data is as easy as replacing a liner (and a few other items).

# Selecting the Right GC Inlet Supplies

Using the wrong liner or septa can have just as negative an impact on your data as a fouled inlet. So, even if you are a seasoned GC veteran, it pays to take the time to be sure that you are using the right GC inlet supplies before worrying about how or when to perform GC inlet maintenance.

## Inlet Liners

In gas chromatography, the inlet is the first part of the instrument that your sample comes in contact with. Using the right liner will aid in sample vaporization; promote efficient, loss-free analyte transfer; and protect your column from contamination—so choosing the correct GC inlet liner is critical for ensuring accurate and precise data. Liners differ in geometric configuration/design, volume, base material, deactivation, and packing. But, choosing the right liner can be greatly simplified by looking at the type of injection. Variations in sample and method may necessitate a different liner, but the following are great initial selections for any analysis.

- Split injection:
  - Topaz Precision split liner with wool.
- Splitless injection:
  - Topaz single taper liner with wool.
- Direct injection:
  - For semivolatiles or compounds that could be affected by a tailing solvent peak: Topaz Uniliner liner with the hole drilled near the bottom.
  - For aqueous injections or compounds that elute away from the solvent peak: Topaz Uniliner liner with the hole drilled near the top.
- Gas samples via sample loop injection:
  - Topaz straight liner with a 1.0 mm ID.
- PTV injection:
  - Instrument-specific Topaz liner with a small inner diameter and at least one baffle or dimple.

For more information about liner selection, visit [www.restek.com/liner-choice](http://www.restek.com/liner-choice)



## Septa

Choosing the right septum for your inlet is even easier. Restek offers several options that are designed to avoid septum bleed and coring, which can damage your column and your data:

- For temperatures up to 350 °C\*:
  - Thermolite Plus Septa
- For temperatures up to 400 °C\*:
  - Premium Non-Stick BTO Septa
- When coring is an issue (can create unwanted activity):
  - Thermolite Plus or Premium Non-Stick BTO Septa with CenterGuide dimple
  - Merlin Microseal Septa

For more information choosing the right septum for your analysis, as well as a handy size chart and septum choice guidelines, visit [www.restek.com/septum-choice](http://www.restek.com/septum-choice)

\*For 17 mm inlets, the maximum temperature for Thermolite Plus septa is 300 °C and the maximum temperature for BTO septa is 330 °C. For all injectors, minimum recommended operating temperature for BTO septa is 250 °C.



## Inlet Seals

Choosing the right inlet seal is more a matter of convenience and preference than data integrity.

As a general rule, however, especially for sensitive or splitless analyses, you want to avoid bare stainless steel and, instead, use highly inert gold-plated seals to reduce breakdown and adsorption of active compounds.

Restek offers several models of gold-plated inlet seals with washerless installation, including the customer favorite Dual Vespel Ring inlet seal. Its patented design features two soft Vespel rings—embedded in both the top and bottom surfaces—to help ensure a low-torque, leak-tight seal, even after repeated temperature cycles.



## Preventative GC Inlet Maintenance

Only after you have confirmed that you are using the right GC inlet supplies is it time to think about GC inlet maintenance. Even within a single industry like environmental testing—let alone across separate industries such as petrochemical, food safety, and clinical diagnostics—there are simply too many variables in samples, injection techniques, instruments, detectors, etc., to be able to recommend a single general schedule to all analysts for replacing all liners, septa, and inlet seals. Your GC inlet maintenance schedule could be twice a day if you are running particularly dirty samples, or once a year if you are using headspace GC. You need to determine your preventative maintenance (PM) schedule on an analysis-by-analysis basis.

When establishing a PM schedule specific to an analysis, the key term is “preventative.” You are trying to **prevent** unwanted downtime by replacing your inlet supplies **before** you have a problem. This way, you can plan for the downtime and choose a time that is not disruptive to your lab. You can also avoid lengthy troubleshooting sessions and missed deadlines.

Simply keep track of how long it generally takes after maintenance to begin seeing data problems commonly associated with the inlet, and then schedule your PM for that analysis and instrument to occur **before** data problems tend to arise.

### Common data problems that can alert you to the need for GC inlet maintenance are:

- Loss of signal / loss of response
  - Inlet activity
  - Inlet discrimination
  - Inlet leaks (e.g., seals around septa, O-rings, ferrules, etc.)
- Extraneous signal
  - Contamination
    - O-ring bleed
    - Septum particles in the liner
    - Matrix buildup in the liner (off-gassing)
  - Inlet activity
    - Analyte breakdown creating new compounds (extra peaks)
- Distorted signal / deteriorating peak shape (e.g., peak tailing)
  - Inlet activity
  - Inlet leaks (e.g., seals around septa, O-rings, ferrules, etc.)



Once you've set your preventative maintenance schedule, you will also want to plan ahead for the components you will be replacing and order your GC inlet supplies in advance. Restek's chromatography experts recommend replacing septa, liners, O-rings, and inlet seals at the same time when you perform GC inlet maintenance. After all, you could unknowingly have issues with multiple components, and the cost of each of these items is minimal compared to having to take your instrument offline more often than you needed.

### Which One to Choose...

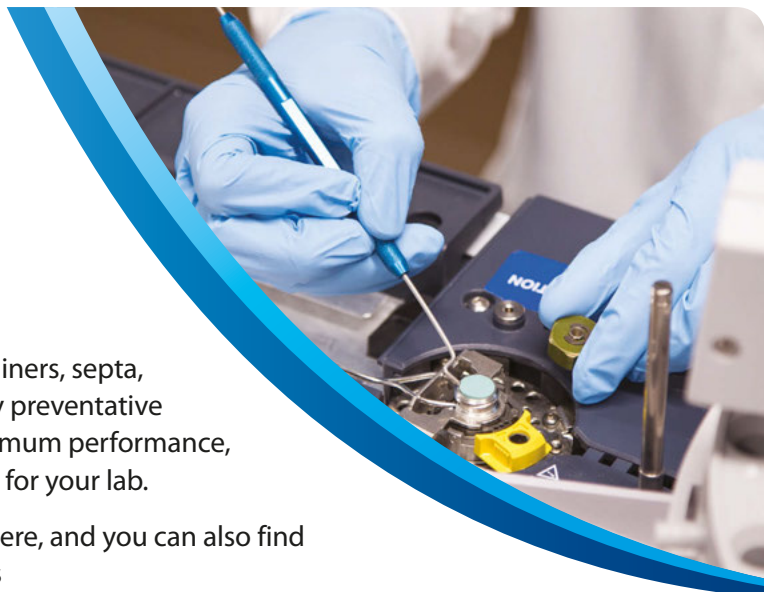
Do you need additional assistance with selecting the right GC inlet supplies or with GC inlet maintenance? Contact Restek Technical Service ([support@restek.com](mailto:support@restek.com)) or your local Restek representative.



# Peak Performance Ensured by Proper GC Inlet Supplies, Maintained Properly

Choosing the right GC inlet supplies—Restek Topaz liners, septa, inlet seals—and implementing a rigorous and timely preventative GC inlet maintenance schedule can help ensure optimum performance, maximum reproducibility, and minimized downtime for your lab.

The inlet supplies you need to get started are right here, and you can also find them at [www.bgb-info.com/restek-gc-accessories](http://www.bgb-info.com/restek-gc-accessories)



## Inlet Supplies for Agilent GCs

### Topaz Inlet Liners for Agilent GCs

#### Split/Splitless Liners for Agilent GCs

COLUMN INSTALLS THIS END



#### Topaz 1.0 mm ID Straight Inlet Liner

for Agilent GCs equipped with split/splitless inlets

ID x OD x Length	qty	Similar to Part #	cat.#
1.0 mm x 6.3 mm x 78.5 mm	5-pk.	Agilent 18740-80200 (ea.), 5190-4047 (ea.)	23333



#### Topaz 2.0 mm ID Single Taper Inlet Liner

for Agilent GCs equipped with split/splitless inlets

ID x OD x Length	qty	cat.#
2.0 mm x 6.5 mm x 78.5 mm	5-pk.	23315



#### Topaz 2.0 mm ID Single Taper Inlet Liner w/ Wool

for Agilent GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	cat.#
2.0 mm x 6.5 mm x 78.5 mm	Quartz Wool	5-pk.	23316



#### Topaz 2.0 mm ID Split Precision Inlet Liner w/ Wool

for Agilent GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	cat.#
2.0 mm x 6.3 mm x 78.5 mm	Quartz Wool	5-pk.	23468



#### Topaz 2.0 mm ID Straight Inlet Liner

for Agilent GCs equipped with split/splitless inlets

ID x OD x Length	qty	Similar to Part #	cat.#
2.0 mm x 6.5 mm x 78.5 mm	5-pk.	Agilent 5181-8818 (ea.), 5183-4703 (5-pk.), 5183-4704 (25-pk.), 5190-6168 (ea.)	23313



### Topaz 2.0 mm ID Straight Inlet Liner w/ Wool

for Agilent GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	cat.#
2.0 mm x 6.5 mm x 78.5 mm	Quartz Wool	5-pk.	23314



### Topaz 4.0 mm ID Cyclo Double Taper Inlet Liner

for Agilent GCs equipped with split/splitless inlets

ID x OD x Length	qty	cat.#
4.0 mm x 6.5 mm x 78.5 mm	5-pk.	23310



### Topaz 4.0 mm ID Cyclo Inlet Liner

for Agilent GCs equipped with split/splitless inlets

ID x OD x Length	qty	cat.#
4.0 mm x 6.3 mm x 78.5 mm	5-pk.	23312



### Topaz 4.0 mm ID Double Taper Inlet Liner

for Agilent GCs equipped with split/splitless inlets

ID x OD x Length	qty	Similar to Part #	cat.#
4.0 mm x 6.5 mm x 78.5 mm	5-pk.	Agilent 5181-3315 (ea.), 5183-4705 (5-pk.), 5183-4706 (25-pk.), 5190-3983 (ea.), 5190-4007 (5-pk.)	23308



### Topaz 4.0 mm ID Drilled Uniliner Inlet Liner with Hole near Bottom

for Agilent GCs equipped with split/splitless inlets

ID x OD x Length	qty	Similar to Part #	cat.#
4.0 mm x 6.3 mm x 78.5 mm	5-pk.	Agilent G1544-80730 (ea.), 5190-7020 (5-pk.)	23306



### Topaz 4.0 mm ID Drilled Uniliner Inlet Liner with Hole near Bottom w/ Wool

for Agilent GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	cat.#
4.0 mm x 6.3 mm x 78.5 mm	Quartz Wool	5-pk.	23307



### Topaz 4.0 mm ID Low Pressure Drop Inlet Liner w/ Wool

for Agilent GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
4.0 mm x 6.3 mm x 78.5 mm	Quartz Wool	5-pk.	Agilent 5183-4647 (ea.), 5183-4701 (5-pk.), 5190-2295 (ea.), 5190-3165 (25-pk.), 5190-3169 (25-pk.), 5190-3173 (100-pk.)	23467



### Topaz 4.0 mm ID Low Pressure Drop Precision Inlet Liner w/ Wool

for Agilent GCs and Lucidity miniGCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
4.0 mm x 6.3 mm x 78.5 mm	Quartz Wool	5-pk.	Agilent 5190-3165 (5-pk.), 5190-3169 (25-pk.), 5183-4701 (5-pk.), 5183-4702 (25-pk.)	23309



### Topaz 4.0 mm ID Precision Inlet Liner w/ Wool

for Agilent GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
4.0 mm x 6.3 mm x 78.5 mm	Quartz Wool	5-pk.	Agilent 210-4004-5	23305



### Topaz 4.0 mm ID Single Taper Inlet Liner

for Agilent GCs equipped with split/splitless inlets

ID x OD x Length	qty	Similar to Part #	cat.#
4.0 mm x 6.5 mm x 78.5 mm	5-pk.	Agilent 5181-3316 (ea.), 5183-4695 (5-pk.), 5183-4696 (25-pk.), 5190-2292 (ea.), 5190-3162 (5-pk.), 5190-3166 (25-pk.), 5190-3170 (100-pk.)	23302



### Topaz 4.0 mm ID Single Taper Inlet Liner w/ Wool

for Agilent GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
4.0 mm x 6.5 mm x 78.5 mm	Quartz Wool	5-pk.	Agilent 5062-3587 (ea.), 5183-4693 (5-pk.), 5183-4694 (25-pk.), 5190-2293 (ea.), 5190-3163 (5-pk.), 5190-3167 (25-pk.), 5190-3171 (100-pk.)	23303



### Topaz 4.0 mm ID Straight Inlet Liner

for Agilent GCs equipped with split/splitless inlets

ID x OD x Length	qty	Similar to Part #	cat.#
4.0 mm x 6.3 mm x 78.5 mm	5-pk.	Agilent 210-3003 (ea.), 210-3003-5 (5-pk.)	23301



### Topaz 4.0 mm ID Straight Inlet Liner w/ Wool

for Agilent GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
4.0 mm x 6.3 mm x 78.5 mm	Quartz Wool	5-pk.	Agilent 5190-3172 (100-pk.), 19251-60540 (ea.), 5183-4691 (5-pk.), 5183-4692 (25-pk.), 5190-2294 (ea.), 5190-3164 (5-pk.), 5190-3168 (25-pk.)	23300

## CIS4 and PTV Liners for Agilent GCs



### Topaz 1.5 mm ID Baffled Inlet Liner

for Agilent GCs equipped with CIS4/PTV inlets

ID x OD x Length	qty	Similar to Part #	cat.#
1.5 mm x 3.0 mm x 71 mm	10-pk.	Agilent 5183-2037; Gerstel 011711-010-00	23433



### Topaz 1.7 mm ID On-Column Inlet Liner

for Agilent GCs equipped with CIS4/PTV inlets

ID x OD x Length	qty	cat.#
1.7 mm x 3.0 mm x 71 mm	5-pk.	23430



### Topaz 2.0 mm ID Baffled CIS4/TDU Inlet Liner

for Agilent GCs equipped with CIS4/PTV inlets

ID x OD x Length	qty	Similar to Part #	cat.#
2.0 mm x 3.0 mm x 78 mm	10-pk.	Gerstel 012436-010-00	23282



### Topaz 2.0 mm ID Single Baffle CIS4/TDU Inlet Liner

for Agilent GCs equipped with CIS4/PTV inlets

ID x OD x Length	qty	Similar to Part #	cat.#
2.0 mm x 3.0 mm x 78 mm	10-pk.	Gerstel 013775-010-00	23283



### Topaz 2.0 mm ID Single Baffle CIS4/TDU Inlet Liner w/ Wool

for Agilent GCs equipped with CIS4/PTV inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
2.0 mm x 3.0 mm x 78 mm	Quartz Wool	10-pk.	Gerstel 012742-010-00	23284



### Topaz 2.0 mm ID Single Baffle Inlet Liner

for Agilent GCs equipped with CIS4/PTV inlets



ID x OD x Length	qty	Similar to Part #	cat.#
2.0 mm x 3.0 mm x 71 mm	10-pk.	Agilent 5183-2036; Gerstel 011709-010-00	23431

### Topaz 2.0 mm ID Single Baffle Inlet Liner w/ Wool

for Agilent GCs equipped with CIS4/PTV inlets

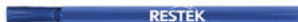


ID x OD x Length	Packing	qty	Similar to Part #	cat.#
2.0 mm x 3.0 mm x 71 mm	Quartz Wool	10-pk.	Agilent 5183-2038; Gerstel 007519-010-00	23432

### Analytical Controls TPI Inlet Liners for Agilent GCs

#### Topaz 2.4 mm ID Analytical Controls TPI Inlet Liner for 0.25/0.32 mm ID columns

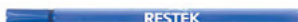
for Agilent GCs equipped with PTV inlets



ID x OD x Length	qty	cat.#
2.4 mm x 4.0 mm x 71 mm	10-pk.	23428

#### Topaz 2.4 mm ID Analytical Controls TPI Inlet Liner for 0.53 mm ID columns

for Agilent GCs equipped with PTV inlets



ID x OD x Length	qty	cat.#
2.4 mm x 4.0 mm x 71 mm	10-pk.	23429

### SPME Liners for Agilent GCs

#### Topaz 0.75 mm ID Straight/SPME Inlet Liner

for Agilent GCs equipped with split/splitless inlets



ID x OD x Length	qty	Similar to Part #	cat.#
0.75 mm x 6.35 mm x 78.5 mm	5-pk.	Agilent 5190-7045 (25-pk.), 5190-4048 (ea.), 5190-4056 (5-pk.)	23434

#### Topaz 1.8 mm ID Straight/SPME Inlet Liner

for Agilent GCs equipped with split/splitless inlets



ID x OD x Length	qty	cat.#
1.8 mm x 6.5 mm x 78.5 mm	5-pk.	23280

### Direct Injection Liners for Agilent GCs (for 0.25/0.32/0.53 mm ID Columns)

#### Topaz 4.0 mm ID Drilled Uniliner Inlet Liner with Hole near Bottom

for Agilent GCs equipped with split/splitless inlets



ID x OD x Length	qty	Similar to Part #	cat.#
4.0 mm x 6.3 mm x 78.5 mm	5-pk.	Agilent G1544-80730 (ea.), 5190-7020 (5-pk.)	23306

#### Topaz 4.0 mm ID Drilled Uniliner Inlet Liner with Hole near Bottom w/ Wool

for Agilent GCs equipped with split/splitless inlets



ID x OD x Length	Packing	qty	cat.#
4.0 mm x 6.3 mm x 78.5 mm	Quartz Wool	5-pk.	23307

#### Topaz 4.0 mm ID Drilled Uniliner Inlet Liner with Hole near Top

for Agilent GCs equipped with split/splitless inlets



ID x OD x Length	qty	cat.#
4.0 mm x 6.3 mm x 78.5 mm	5-pk.	23311

## Inlet Supplies for Agilent GCs



22811

Note: Merlin Microseal septa require a 23-gauge (0.63 mm, 0.025") needle or probe with a blunt, truncated conical tip. Compatible syringes and replacement needles are available at [www.restek.com](http://www.restek.com).

### Merlin Microseal Septa

for Agilent GCs

- Eliminates septum coring and prolongs septum life.
- Consistently low needle-insertion force.
- Simple installation with no injection port modification.
- Smaller diameter to accept 23-gauge needles and SPME fibers.
- 400 °C max injection port temperature.

The advantages of the Merlin Microseal septum include elimination of septum coring; longer life; and consistently low needle-insertion force. The Microseal septum incorporates two separate sealing mechanisms. These sliding seals eliminate septum coring and the resulting accumulation of septum crumbs in the injection port liner.

The Microseal septum uses a 23-gauge (0.63 mm, 0.025") needle or probe with a blunt, truncated conical tip. Because the syringe plunger end details are determined by manual or autosampler compatibility, often a removable needle syringe is an effective way to match both of these requirements. No adapter is required for the Agilent inlet. Installation is simple, requiring no modification of the injection port.

### Merlin Microseal Septa for Agilent GCs

Includes	Type	Vendor cat.#	qty.	Similar to Part #	cat.#
nut (1); general-purpose (#410) Microseals (2)	General-Purpose Kit (3 to 100 psi), 2 Seals	404	kit	Agilent 5181-8833; Supelco/Millipore Sigma 24814-U	22810
nut (1); general-purpose (#410) Microseal (1)	General-Purpose Kit (3 to 100 psi), 1 Seal	405	kit	Agilent 5182-3442; Supelco/Millipore Sigma 24815-U	22811
nut (1); low-pressure (#310) Microseals (2)	Low-Pressure Kit (1 to 45 psi), 2 Seals	304	kit	Supelco/Millipore Sigma 22581-U	22813
nut (1); low-pressure (#310) Microseal (1)	Low-Pressure Kit (1 to 45 psi), 1 Seal	305	kit	Agilent 5181-8816; Supelco/Millipore Sigma 22584	22814



### Merlin Microseal Replacement Nut for Agilent GCs

Vendor cat.#	qty.	Similar to Part #	cat.#
403	ea.	Agilent 5182-3445; Supelco/Millipore Sigma 22582	22809



22812

### Merlin Microseal Replacement Septa

Type	Vendor cat.#	qty.	Similar to Part #	cat.#
Microseal for Traditional SPME Fiber Applications (3 to 100 psi)	21-01	ea.	Supelco/Millipore Sigma 24818-U	22782
General-Purpose Microseal (most applications, 3 to 100 psi)	410	ea.	Agilent 5182-3444; PerkinElmer N9303345; Supelco/Millipore Sigma 24816-U	22812
Low-Pressure Microseal (1 to 45 psi)	310	ea.	Agilent 5181-8815; Supelco/Millipore Sigma 22583	22815

## Dual Vespel Ring Inlet Seals

Washerless, Leak-Tight Seals for Agilent GCs

- Does not require a separate washer.
- Requires less torque to seal.
- Does not require retightening of reducing nut after several oven cycles.
- Extends column lifetime by preventing oxygen from reaching the column.
- Same price as the regular inlet seals with washers.
- Gold plating provides enhanced inertness versus stainless steel.



21240

Description	ID	Instrument	Material	qty.	cat.#
Dual Vespel Ring Inlet Seal	0.8 mm	for Agilent GCs	Stainless Steel	2-pk.	21238
	0.8 mm	for Agilent GCs	Stainless Steel	10-pk.	21239
	0.8 mm	for Agilent GCs	Gold-Plated	2-pk.	21240
	0.8 mm	for Agilent GCs	Gold-Plated	10-pk.	21241
	0.8 mm	for Agilent GCs	Siltek-Treated	2-pk.	21242
	0.8 mm	for Agilent GCs	Siltek-Treated	10-pk.	21243
	1.2 mm	for Agilent GCs	Stainless Steel	2-pk.	21244
	1.2 mm	for Agilent GCs	Stainless Steel	10-pk.	21245
	1.2 mm	for Agilent GCs	Gold-Plated	2-pk.	21246
	1.2 mm	for Agilent GCs	Gold-Plated	10-pk.	21247
	1.2 mm	for Agilent GCs	Siltek-Treated	2-pk.	21248
	1.2 mm	for Agilent GCs	Siltek-Treated	10-pk.	21249
	0.8 mm	for Agilent GCs	Gold-Plated	50-pk.	23418
	0.8 mm	for Agilent GCs	Siltek-Treated	50-pk.	23419
	0.8 mm	for Agilent GCs	Stainless Steel	50-pk.	23420

Patented

## Flip Seal Dual Vespel Ring Inlet Seals

Restek Innovation! Patented.

Reversible Flip Seal Inlet Seal—Same Cost, Extended Lifetime

- Reversible, two-sided design allows significantly more analyses than other seals, at the same price—simply use, flip, then use again!
- Vespel ring embedded in top and bottom surface eliminates need for a washer.
- Highly inert gold seals reduce breakdown and adsorption of active compounds, maximizing component transfer to GC column.
- Very little torque required to make seal—reduces operator variability.

Note: The Flip Seal inlet seal requires a special reducing nut adaptor fitting, which is included in the kit.



23413

Description	Includes	ID	Material	qty.	cat.#
Flip Seal Dual Vespel Ring Inlet Seal Kit	gold-plated inlet seal, reducing nut adaptor, 1/16" SS nut			kit	23406
Flip Seal Dual Vespel Ring Inlet Seal		1.2 mm	Gold-Plated	2-pk.	23411
		1.2 mm	Siltek-Deactivated	2-pk.	23412
		1.2 mm	Gold-Plated	10-pk.	23413
		1.2 mm	Siltek-Deactivated	10-pk.	23414

The Flip Seal Adaptor can be used with standard 1/16" ferrules.

Patented



23406

## Inlet Supplies for Agilent GCs



22083



22085

### Dual Vespel Ring Cross-Disk Inlet Seals

for Agilent GCs

- Ideal for high-flow split applications >500 mL/min.
- Washerless, leak-tight seals.

Description	ID	Material	qty.	cat.#
Dual Vespel Ring Cross-Disk Inlet Seal	0.8 mm	Gold-Plated	2-pk.	22083
	0.8 mm	Gold-Plated	10-pk.	22084
	0.8 mm	Siltek-Treated	2-pk.	22085
	0.8 mm	Siltek-Treated	10-pk.	22086



21317

### Replacement Inlet Seals

for Agilent GCs

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

Description	ID	Material	Used with	qty.	Similar to Part #	cat.#
Replacement Inlet Seal	1.2 mm	Stainless Steel	0.25/0.32 mm ID Dual-column	2-pk.		20390
	1.2 mm	Stainless Steel	0.25/0.32 mm ID Dual-column	10-pk.		20391
	1/16-inch	Stainless Steel	0.53 mm ID Dual-Column	2-pk.		20392
	1/16-inch	Stainless Steel	0.53 mm ID Dual-Column	10-pk.		20393
	1.2 mm	Gold-Plated	0.25/0.32 mm ID Dual-column	2-pk.		21305
	1.2 mm	Gold-Plated	0.25/0.32 mm ID Dual-column	10-pk.		21306
	1.2 mm	Siltek-Treated	0.25/0.32 mm ID Dual-column	2-pk.		21307
	1.2 mm	Siltek-Treated	0.25/0.32 mm ID Dual-column	10-pk.		21308
	0.8 mm	Stainless Steel	Single-column	2-pk.	Agilent 18740-20880	21315
	0.8 mm	Stainless Steel	Single-column	10-pk.		21316
	0.8 mm	Gold-Plated	Single-column	2-pk.	Agilent 5188-5367	21317
	0.8 mm	Gold-Plated	Single-column	10-pk.	Agilent 5190-2209	21318
	0.8 mm	Siltek-Treated	Single-column	2-pk.		21319
	0.8 mm	Siltek-Treated	Single-column	10-pk.		21320
	0.8 mm	Gold-Plated	Single-column	50-pk.		23415
	0.8 mm	Siltek-Treated	Single-column	50-pk.		23416
	0.8 mm	Stainless Steel	Single-column	50-pk.		23417

### Cross-Disk Inlet Seals

for Agilent GCs

- Ideal for high-flow split applications >500 mL/min on Agilent 5890 GCs.
- Gold plating provides enhanced inertness versus stainless steel.
- All seals include washers.



20476

Description	ID	Instrument	Material	qty.	Similar to Part #	cat.#
Cross-Disk Inlet Seal	0.8 mm	for Agilent GCs	Siltek-Treated	10-pk.		20474
	0.8 mm	for Agilent GCs	Siltek-Treated	2-pk.		20475
	0.8 mm	for Agilent GCs	Gold-Plated	10-pk.	Agilent 5182-9652	20476
	0.8 mm	for Agilent GCs	Gold-Plated	2-pk.	Agilent 5182-9652	20477
	1.2 mm	for Agilent GCs	Gold-Plated	2-pk.		21009
	1.2 mm	for Agilent GCs	Gold-Plated	10-pk.		21010
	1.2 mm	for Agilent GCs	Siltek-Treated	2-pk.		21011
	1.2 mm	for Agilent GCs	Siltek-Treated	10-pk.		21012

## Replacement Viton O-Rings for use with the Agilent Flip Top Inlet Sealing System

Description	Instrument	Material	qty.	Similar to Part #	cat.#
Replacement O-Rings for use with the Agilent Flip Top Inlet Sealing System		Viton	10-pk.	Agilent 5188-5366	22336



22336

### Viton O-Rings

For Agilent, PerkinElmer 590/690, Thermo 1300/1310, and Varian 1177 GCs

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

Description	Instrument	Material	Max Temp	qty.	Similar to Part #	cat.#
O-Rings	for Agilent, PerkinElmer Clarus 590/690, Thermo TRACE 1300/1310, and Varian 1177 GCs	Viton	300 °C	10-pk.	Agilent 5188-5365; PerkinElmer 09926068 (1-pk), L1003161 (5-pk); Thermo Fisher Scientific 29001320	22241
	for Agilent, PerkinElmer Clarus 590/690, Thermo TRACE 1300/1310, and Varian 1177 GCs	Viton	300 °C	50-pk.	Grace 7019, 3112735	22242



22241

### Inlet Liner Seals

for Agilent and Bruker/Varian 1177 Injectors

Excellent thermal stability at injection port temperatures up to 450 °C!

Description	ID	Material	Max Temp	Used with	qty.	Similar to Part #	cat.#
O-Rings	6.35 mm	Graphite	450 °C	for split liners	10-pk.	Agilent 5180-4168	20296
	6.35 mm	Graphite	450 °C	for split liners	50-pk.	Agilent 5180-4168	20297
	6.5 mm	Graphite	450 °C	for splitless liners	10-pk.	Agilent 5180-4173; Scion/Bruker/Varian 39-26119-40	20298
	6.5 mm	Graphite	450 °C	for splitless liners	50-pk.	Agilent 5180-4173	20299



20298

### Viton O-Rings

for Apex Liners

Description	Material	Max Temp	qty.	cat.#
O-Rings for APEX liners	Viton	250 °C	25-pk.	22067



22067

### Inlet Wrench

for Agilent 5890/6850/6890 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	Instrument	qty.	Similar to Part #	cat.#
Inlet Wrench	for Agilent 5890/6850/6890 GCs	ea.	Agilent 19251-00100	22065



22065

### Septum Nut Removal Tool

for Agilent 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.

Description	Instrument	qty.	cat.#
Septum Nut Removal Tool	for Agilent GCs	ea.	24918



24918

restek innovation!

## Inlet Supplies for Agilent GCs



22181

### Inlet Maintenance Kit

for Agilent GCs

- Includes 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 Plus septa with CenterGuide
- Topaz 4.0 mm ID single taper liner with wool
- Topaz 4.0 mm ID straight liner with wool
- Capillary column caps
- ¼" x ⅝" wrench
- Septum puller
- Installation gauge
- Wire cleaning brush
- Jet reamers/ferrule removers
- Inlet liner removal tool
- Septa nut removal tool

Description	Instrument	qty.	cat.#
Inlet Maintenance Kit	for Agilent 5890/6850/6890/7890 GCs	kit	22181



22186

### Make Life Easier (MLE) Capillary Tool Kit

for Agilent GCs

Everything you need in one complete kit!

Includes:

- Capillary installation gauge for Agilent GCs
- Inlet wrench for Agilent GCs
- Septum nut removal tool
- ⅛", ⅜", and ¼" nylon brushes
- ¼", ⅜", and ⅝" stainless steel wire tube brushes
- Stainless steel surface brush
- 6 stainless steel jet reamers/ferrule removers (0.25–0.65 mm OD)
- ¼" x ⅝" open end wrench
- ⅜" x ⅞" open end wrench
- ⅞" x ½" open end wrench
- ½" x ⅝" open end wrench
- Slide-lock tweezers
- Scoring wafers
- Inlet liner removal tool
- Septum puller
- Mini wool puller/insertor tool
- 4-inch tapered needle file
- 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)

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



21102

### FastPack Inlet Kits

for Agilent GCs

- Convenient: all the parts you need in one package—no hunting for individual items.
- Economical: costs less than the sum of the individual parts.
- Clean: Mylar bag is factory sealed; no contamination of the products from weeks in the lab.

Routine Maintenance with FastPack Inlet Kits (1 pack includes 5 maintenance kits.)

Description	Type	Liner Dimensions	qty.	cat.#
FastPack Inlet Kit	4 mm Topaz Straight	4 mm ID, 6.3 mm OD, 78.5 mm long	pack of 5 kits	21101
	4 mm Topaz Single Taper	4 mm ID, 6.5 mm OD, 78.5 mm long	pack of 5 kits	21102
	4 mm Topaz Straight with Wool	4 mm ID, 6.3 mm OD, 78.5 mm long	pack of 5 kits	21104
	4 mm Topaz Single Taper Splitless with Wool	4 mm ID, 6.5 mm OD, 78.5 mm long	pack of 5 kits	23258
	4 mm Topaz Precision with Wool	4 mm ID, 6.3 mm OD, 78.5 mm long	pack of 5 kits	23259

1 pack includes 5 maintenance kits. Each maintenance kit includes: 4 mm Topaz inlet liner; Viton O-ring; 0.8 mm ID gold-plated inlet seal and washer; 11 mm Thermolite Plus CenterGuide septum.

# Inlet Supplies for Bruker/Varian GCs

## Topaz Inlet Liners for Bruker/Varian GCs

### Liners for Bruker/Varian 1177 S/SL Injection Ports



**Topaz 4.0 mm ID Frit Inlet Liner** for Bruker/Varian GCs equipped with 1177 inlets

ID x OD x Length	Packing	qty	cat.#
4.0 mm x 6.3 mm x 78.5 mm	Glass Frit	5-pk.	23330



**Topaz 4.0 mm ID Precision Inlet Liner w/ Wool** for Bruker/Varian GCs equipped with 1177 inlets

ID x OD x Length	Packing	qty	cat.#
4.0 mm x 6.3 mm x 78.5 mm	Quartz Wool	5-pk.	23328



**Topaz 4.0 mm ID Single Taper Inlet Liner** for Bruker/Varian GCs equipped with 1177 inlets

ID x OD x Length	qty	Similar to Part #	cat.#
4.0 mm x 6.5 mm x 78.5 mm	5-pk.	Scion/Bruker/Varian 392611927	23331



**Topaz 4.0 mm ID Single Taper Inlet Liner w/ Wool**

for Bruker/Varian GCs equipped with 1177 inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
4.0 mm x 6.5 mm x 78.5 mm	Quartz Wool	5-pk.	Scion/Bruker/Varian 392611936	23332

### SPI Liners for Bruker/Varian S/SL Injection Ports



**Topaz 0.53 mm ID Straight Inlet Liner** for Bruker/Varian GCs equipped with SPI inlets

ID x OD x Length	qty	Similar to Part #	cat.#
0.53 mm x 4.6 mm x 54 mm	5-pk.	Scion/Bruker/Varian 190010906	23460



**Topaz 0.80 mm ID Straight Inlet Liner** for Bruker/Varian GCs equipped with SPI inlets

ID x OD x Length	qty	Similar to Part #	cat.#
0.80 mm x 4.6 mm x 54 mm	5-pk.	Agilent 8004-0167; Grace 4984, 5122991; Scion/Bruker/Varian 190010907	23461

### Liners for Bruker/Varian 1078/1079 Injection Ports



**Topaz 0.75 mm ID Straight Inlet Liner** for Bruker/Varian GCs equipped with 1078/1079 inlets

ID x OD x Length	qty	Similar to Part #	cat.#
0.75 mm x 5.0 mm x 54 mm	5-pk.	Scion/Bruker/Varian 392611948	23465



**Topaz 2.0 mm ID Top Taper Inlet Liner** for Bruker/Varian GCs equipped with 1078/1079 inlets

ID x OD x Length	qty	Similar to Part #	cat.#
2.0 mm x 5.0 mm x 54 mm	5-pk.	Scion/Bruker/Varian 392611947	23463



**Topaz 3.4 mm ID Frit Inlet Liner with Top Taper** for Bruker/Varian GCs equipped with 1078/1079 inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
3.4 mm x 5.0 mm x 54 mm	Glass Frit	5-pk.	Scion/Bruker/Varian 392611946	23462



**Topaz 3.4 mm ID Precision Inlet Liner with Top Taper w/ Wool**

for Bruker/Varian GCs equipped with 1078/1079 inlets

ID x OD x Length	Packing	qty	cat.#
3.4 mm x 5.0 mm x 54 mm	Quartz Wool	5-pk.	23466



**Topaz 3.4 mm ID Top Taper Inlet Liner** for Bruker/Varian GCs equipped with 1078/1079 inlets

ID x OD x Length	qty	Similar to Part #	cat.#
3.4 mm x 5.0 mm x 54 mm	5-pk.	Scion/Bruker/Varian 392611945	23329

COLUMN INSTALLS THIS END

## Inlet Supplies for Bruker/Varian GCs



22779

Note: Merlin Microseal septa require the appropriate adaptor kit or nut for your GC. Choose standard Microseal kits/nuts for use with needles and traditional SPME fibers; choose SPME Arrow Microseal kits/nuts for use with SPME Arrow. Select a replacement seal and see Restek Recommends to order.

### Merlin Microseal Septa

for Bruker/Varian GCs

- Eliminates septum coring and prolongs septum life.
- Consistently low needle-insertion force.
- Simple installation with no injection port modification.
- Smaller diameter to accept 23-gauge needles and SPME fibers.
- 400 °C max injection port temperature.

The advantages of the Merlin Microseal septum include elimination of septum coring, longer life, and consistently low needle-insertion force. The Microseal septum incorporates two separate sealing mechanisms. These sliding seals eliminate septum coring and the resulting accumulation of septum crumbs in the injection port liner.

The Microseal septum uses a 23-gauge (0.63 mm, 0.025") needle or probe with a blunt, truncated conical tip. Because the syringe plunger end details are determined by manual or autosampler compatibility, often a removable needle syringe is an effective way to match both of these requirements. Installation is simple, requiring no modification of the injection port.

Description	Vendor cat.#	Similar to Part #	cat.#
General-Purpose Kit for Bruker/Varian 1078/1079 GCs includes: nut (1); adaptor (1); O-ring; general-purpose (#410) Microseal (1)	21-11	Supelco/Millipore Sigma 24817-U	22779
General-Purpose Kit for Bruker/Varian 1177 GCs includes: nut (1); adaptor (1); O-ring; general-purpose (#410) Microseal (1)	22-11	Supelco/Millipore Sigma 22609-U	22780

### Merlin Microseal Replacement Septa

Type	Vendor cat.#	qty.	Similar to Part #	cat.#
Microseal for 26 gauge or 23/26 gauge tapered needles (5 to 100 psi)	610	ea.		22264
Microseal for Traditional SPME Fiber Applications (3 to 100 psi)	21-01	ea.	Supelco/Millipore Sigma 24818-U	22782
General-Purpose Microseal (most applications, 3 to 100 psi)	410	ea.	Agilent 5182-3444; PerkinElmer N9303345; Supelco/Millipore Sigma 24816-U	22812
Low-Pressure Microseal (1 to 45 psi)	310	ea.	Agilent 5181-8815; Supelco/Millipore Sigma 22583	22815
Microseal for 1.1 mm SPME Arrow Applications (3 to 100 psi)	1100	ea.		23232
Microseal for 1.5 mm SPME Arrow Applications (3 to 100 psi)	1500	ea.		23233



22812



22683

### Liner Seals

for Bruker/Varian 1078/1079 GCs

Description	ID	Instrument	Material	Max Temp	qty.	Similar to Part #	cat.#
Liner Seals	5 mm	for Bruker/Varian 1078/1079 GCs	Graphite	450 °C	10-pk.	Scion/Bruker/Varian 392534201, 392611919	22683



## Inlet Liner Seals

for Agilent and Bruker/Varian 1177 Injectors

Excellent thermal stability at injection port temperatures up to 450 °C!

Description	ID	Material	Max Temp	Used with	qty.	Similar to Part #	cat.#
O-Rings	6.35 mm	Graphite	450 °C	for split liners	10-pk.	Agilent 5180-4168	20296
	6.35 mm	Graphite	450 °C	for split liners	50-pk.	Agilent 5180-4168	20297
	6.5 mm	Graphite	450 °C	for splitless liners	10-pk.	Agilent 5180-4173; Scion/ Bruker/Varian 39-26119-40	20298
	6.5 mm	Graphite	450 °C	for splitless liners	50-pk.	Agilent 5180-4173	20299



20298

## Make Life Easier (MLE) Capillary Tool Kit

for Bruker/Varian GCs

Everything you need in one complete kit!

Includes:

- Capillary installation gauge for Bruker/Varian GCs
- 1/8", 3/16", and 1/4" nylon brushes
- 1/4", 3/8", and 3/16" stainless steel wire tube brushes
- Stainless steel surface brush
- 6 stainless steel jet reamers/ferrule removers (0.25–0.65 mm OD)
- 1/4" x 5/16" open end wrench
- 3/8" x 7/16" open end wrench
- 7/16" x 1/2" open end wrench
- 1/2" x 9/16" open end wrench
- Slide-lock tweezers
- Scoring wafers

- Inlet liner removal tool
- Septum puller
- Mini wool puller/insertor tool
- 4-inch tapered needle file
- 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)



22184

Description	Instrument	qty.	cat.#
MLE Capillary Tool Kit	for Bruker/Varian GCs	kit	22184

## Leak-Free is the Way to Be

A high-quality leak detector—like the Restek Electronic Leak Detector (cat.# 28500)—is a must for every GC lab. Every time you install a new column or perform GC inlet maintenance, be sure to leak-check your GC system before you condition or run an analysis. Minimizing the chances of damaging your column or detector will be well worth the time.

Get yours now at  
[www.restek.com/leakdetector](http://www.restek.com/leakdetector)



# Inlet Supplies for DANI GCs

## Topaz Inlet Liners for DANI GCs

COLUMN INSTALLS THIS END



### Topaz 0.8 mm ID Straight Inlet Liner

for DANI GCs

ID x OD x Length	Includes	qty	cat.#
0.8 mm x 6.0 mm x 70 mm	ferrule set	5-pk.	23286
		5-pk.	23293



### Topaz 2.0 mm ID Straight Inlet Liner

for DANI GCs

ID x OD x Length	Includes	qty	cat.#
2.0 mm x 6.0 mm x 70 mm	ferrule set	5-pk.	23285
		5-pk.	23292



### Topaz 2.2 mm ID Dimpled Liner w/Wool

for DANI GCs

ID x OD x Length	Packing	Includes	qty	cat.#
2.2 mm x 4.0 mm x 55 mm	Quartz Wool	ferrule set	5-pk.	23289
	Quartz Wool		5-pk.	23296



### Topaz 2.2 mm ID Straight Liner w/Wool

for DANI GCs

ID x OD x Length	Packing	qty	cat.#
2.2 mm x 4.0 mm x 85.7 mm	Quartz Wool	5-pk.	23291



### Topaz 4.0 mm ID Single Taper Inlet Liner w/Wool

for DANI GCs

ID x OD x Length	Packing	Includes	qty	cat.#
4.0 mm x 6.0 mm x 70 mm	Quartz Wool	ferrule set	5-pk.	23290
	Quartz Wool		5-pk.	23297



### Topaz 4.0 mm ID Straight Inlet Liner

for DANI GCs

ID x OD x Length	Includes	qty	cat.#
4.0 mm x 6.0 mm x 70 mm	ferrule set	5-pk.	23287
		5-pk.	23294



### Topaz 4.0 mm ID Straight Inlet Liner w/Wool

for DANI GCs

ID x OD x Length	Packing	Includes	qty	cat.#
4.0 mm x 6.0 mm x 70 mm	Quartz Wool	ferrule set	5-pk.	23288
	Quartz Wool		5-pk.	23295



**Topaz**  
INLET LINERS



## Perfect Installation Every Time

There is never a question about which way to install a Topaz liner—simply orient it so that the column installs toward the “R” in the Restek logo.



# Inlet Supplies for PerkinElmer GCs

## Topaz Inlet Liners for PerkinElmer GCs

Inlet Liners for PerkinElmer Clarus 590/690 GCs

COLUMN INSTALLS THIS END



### Topaz 0.75 mm ID Straight/SPME Inlet Liner

for PerkinElmer Clarus 590/690 GCs equipped with split/splitless inlets

ID x OD x Length	qty	Similar to Part #	cat.#
0.75 mm x 6.35 mm x 78.5 mm	5-pk.	PerkinElmer N6502044	23803



### Topaz 1.0 mm ID Straight Inlet Liner

for PerkinElmer Clarus 590/690 GCs equipped with split/splitless inlets

ID x OD x Length	qty	Similar to Part #	cat.#
1.0 mm x 6.3 mm x 78.5 mm	5-pk.	PerkinElmer N6502037	23802



### Topaz 2.0 mm ID Single Taper Inlet Liner

for PerkinElmer Clarus 590/690 GCs equipped with split/splitless inlets

ID x OD x Length	qty	Similar to Part #	cat.#
2.0 mm x 6.5 mm x 78.5 mm	5-pk.	PerkinElmer N6502030	23795



### Topaz 2.0 mm ID Straight Inlet Liner

for PerkinElmer Clarus 590/690 GCs equipped with split/splitless inlets

ID x OD x Length	qty	Similar to Part #	cat.#
2.0 mm x 6.5 mm x 78.5 mm	5-pk.	PerkinElmer N6502033	23798



### Topaz 4.0 mm ID Low Pressure Drop Precision Inlet Liner w/ Wool

for PerkinElmer Clarus 590/690 GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
4.0 mm x 6.3 mm x 78.5 mm	Quartz Wool	5-pk.	PerkinElmer N6502032	23797



### Topaz 4.0 mm ID Precision Inlet Liner w/ Wool

for PerkinElmer Clarus 590/690 GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
4.0 mm x 6.3 mm x 78.5 mm	Quartz Wool	5-pk.	PerkinElmer N6502034	23799



### Topaz 4.0 mm ID Single Taper Inlet Liner

for PerkinElmer Clarus 590/690 GCs equipped with split/splitless inlets

ID x OD x Length	qty	Similar to Part #	cat.#
4.0 mm x 6.5 mm x 78.5 mm	5-pk.	PerkinElmer N6502031	23796



### Topaz 4.0 mm ID Single Taper Inlet Liner w/ Wool

for PerkinElmer Clarus 590/690 GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
4.0 mm x 6.5 mm x 78.5 mm	Quartz Wool	5-pk.	PerkinElmer N6502035	23800



### Topaz 4.0 mm ID Straight Inlet Liner w/ Wool

for PerkinElmer Clarus 590/690 GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
4.0 mm x 6.3 mm x 78.5 mm	Quartz Wool	5-pk.	PerkinElmer N6502036	23801

# Inlet Supplies for PerkinElmer GCs

## Topaz Inlet Liners for PerkinElmer GCs

### Inlet Liners for PerkinElmer Auto SYS GCs



#### Topaz 4.0 mm ID Drilled Uniliner Inlet Liner with Hole near Bottom

for PerkinElmer Auto SYS GCs equipped with split/splitless inlet

ID x OD x Length	qty	Similar to Part #	cat.#
4.0 mm x 6.2 mm x 92.1 mm	5-pk.	PerkinElmer N6502013	23454



#### Topaz 4.0 mm ID Drilled Uniliner Inlet Liner with Hole near Top

for PerkinElmer Auto SYS GCs equipped with split/splitless inlet

ID x OD x Length	qty	Similar to Part #	cat.#
4.0 mm x 6.2 mm x 92.1 mm	5-pk.	PerkinElmer N6121022	23453



#### Topaz 4.0 mm Uniliner Inlet Liner w/ Wool

for PerkinElmer Auto SYS GCs equipped with split/splitless inlet

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
4.0 mm x 6.2 mm x 92.1 mm	Quartz Wool	5-pk.	PerkinElmer N6502016	23452

### Inlet Liners for PerkinElmer Auto SYS and Clarus 580/680 GCs



#### Topaz 4.0 mm ID Precision Inlet Liner w/ Wool

for PerkinElmer Auto SYS and Clarus 580/680 GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
4.0 mm x 6.2 mm x 92.1 mm	Quartz Wool	5-pk.	PerkinElmer N6121020	23450



#### Topaz 4.0 mm ID Straight Inlet Liner w/ Wool

for PerkinElmer Auto SYS and Clarus 580/680 GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
4.0 mm x 6.2 mm x 92.1 mm	Quartz Wool	5-pk.	PerkinElmer N6502009	23449



#### Topaz 2.0 mm ID Inlet Liner w/ Wool

for PerkinElmer Auto SYS and Clarus 580/680 GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
2.0 mm x 6.2 mm x 92.1 mm	Quartz Wool	5-pk.	PerkinElmer N6121021	23451

### PSS Liners for PerkinElmer GCs



#### Topaz 2.0 mm ID Drilled Uniliner Inlet Liner with Hole near Top

for PerkinElmer GCs equipped with PSS Inlet

ID x OD x Length	qty	cat.#
2.0 mm x 4.0 mm x 86.2 mm	5-pk.	23281



#### Topaz 2.0 mm ID Straight Inlet Liner w/ Wool

for PerkinElmer GCs equipped with PSS Inlet

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
2.0 mm x 4.0 mm x 86.2 mm	Quartz Wool	5-pk.	PerkinElmer N6121004	23317

COLUMN INSTALLS THIS END

## Microseal Septa

for PerkinElmer GCs

- Eliminates septum coring and prolongs septum life.
- Consistently low needle-insertion force.
- Simple installation with no injection port modification.
- Smaller diameter to accept 23-gauge needles and SPME fibers.
- 400 °C max injection port temperature.

The advantages of the Merlin Microseal septum include elimination of septum coring, longer life, and consistently low needle-insertion force. The Microseal septum incorporates two separate sealing mechanisms. These sliding seals eliminate septum coring and the resulting accumulation of septum crumbs in the injection port liner.

The Microseal septum uses a 23-gauge (0.63 mm, 0.025") needle or probe with a blunt, truncated conical tip. Because the syringe plunger end details are determined by manual or autosampler compatibility, often a removable needle syringe is an effective way to match both of these requirements. Installation is simple, requiring no modification of the injection port.

Replacement Microseals for general-purpose (3 to 100 psi), low-pressure (1 to 45 psi), and SPME fiber (3 to 100 psi) applications are available. For use in SPME Arrow applications, a different nut/adaptor kit must be used; see Related Products.

Description	Vendor cat.#	qty.	Similar to Part #	cat.#
General-Purpose Kit (3 to 100 psi) for PerkinElmer GCs includes: nut (1); adaptor (1); O-ring; general-purpose (#410) Microseals (2)	51-12	kit	PerkinElmer N9303344	22781



22781

## Microseal Replacement Septa

Type	Vendor cat.#	qty.	Similar to Part #	cat.#
Microseal for 26 gauge or 23/26 gauge tapered needles (5 to 100 psi)	610	ea.		22264
Microseal for Traditional SPME Fiber Applications (3 to 100 psi)	21-01	ea.	Supelco/Millipore Sigma 24818-U	22782
General-Purpose Microseal (most applications, 3 to 100 psi)	410	ea.	Agilent 5182-3444; PerkinElmer N9303345; Supelco/Millipore Sigma 24816-U	22812
Low-Pressure Microseal (1 to 45 psi)	310	ea.	Agilent 5181-8815; Supelco/Millipore Sigma 22583	22815
Microseal for 1.1 mm SPME Arrow Applications (3 to 100 psi)	1100	ea.		23232
Microseal for 1.5 mm SPME Arrow Applications (3 to 100 psi)	1500	ea.		23233



22812



22185

## Make Life Easier (MLE) Capillary Tool Kit

for PerkinElmer GCs

Everything you need in one complete kit!

Includes:

- 1/8", 3/16", and 1/4" nylon brushes
- 1/4", 3/8", and 3/16" stainless steel wire tube brushes
- Stainless steel surface brush
- 6 stainless steel jet reamers/ferrule removers (0.25–0.65 mm OD)
- 1/4" x 5/16" open end wrench
- 3/8" x 7/16" open end wrench
- 7/16" x 1/2" open end wrench
- 1/2" x 9/16" open end wrench
- Slide-lock tweezers
- Scoring wafers
- Inlet liner removal tool
- Septum puller
- Mini wool puller/insertor tool
- 4-inch tapered needle file
- 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)

Description	Instrument	qty.	cat.#
MLE Capillary Tool Kit	for PerkinElmer GCs	kit	22185



20366

## Viton O-Rings

for PerkinElmer PSS Injector

Fits 4 mm OD liners.

Description	Instrument	Material	Max Temp	qty.	Similar to Part #	cat.#
O-Rings	for PerkinElmer PSS Injector	Viton	250 °C	10-pk.	PerkinElmer N6101747	20366



20262

## Silicone O-Rings

for PerkinElmer Auto SYS XL or Clarus 580/680 GCs with CAP Injector

Fits 6.2 mm OD liners.

Description	Instrument	Material	Max Temp	qty.	Similar to Part #	cat.#
O-Rings	for PerkinElmer Auto SYS XL or Clarus 580/680 w/CAP Injector	Silicone	250 °C	10-pk.	PerkinElmer N6101374	20262

## Warm Up Before You Run!

Topaz liners, O-rings, inlet seals, and other Restek GC inlet supplies are manufactured in strictly controlled environments and feature packaging developed specifically for superior cleanliness and chromatographic performance. Despite providing you with incredibly clean and inert inlet supplies, we still recommend that you condition your system after performing GC inlet maintenance to help guarantee the best results possible from the very first injections, so schedule your maintenance accordingly.



# Inlet Supplies for Shimadzu GCs

## Topaz Inlet Liners for Shimadzu GCs

Inlet Liners for Shimadzu 17A, 2010, 2014, and 2030 GCs equipped with split/splitless inlets

COLUMN INSTALLS THIS END



### Topaz 1.8 mm ID Straight/SPME Inlet Liner

for Shimadzu 17A, 2010, 2014, and 2030 GCs equipped with split/splitless inlets

ID x OD x Length	qty	cat.#
1.8 mm x 5.0 mm x 95 mm	5-pk.	23279



### Topaz 3.5 mm ID Cyclo Single Taper Inlet Liner

for Shimadzu 17A, 2010, 2014, and 2030 GCs equipped with split/splitless inlets

ID x OD x Length	qty	cat.#
3.5 mm x 5.0 mm x 95 mm	5-pk.	23456



### Topaz 3.5 mm ID Double Taper Inlet Liner

for Shimadzu 17A, 2010, 2014, and 2030 GCs equipped with split/splitless inlets

ID x OD x Length	qty	cat.#
3.5 mm x 5.0 mm x 95 mm	5-pk.	23457



### Topaz 3.5 mm ID Precision Inlet Liner w/ Wool

for Shimadzu 17A, 2010, 2014, and 2030 GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	cat.#
3.5 mm x 5.0 mm x 95 mm	Quartz Wool	5-pk.	23320



### Topaz 3.5 mm ID Single Taper Inlet Liner

for Shimadzu 17A, 2010, 2014, and 2030 GCs equipped with split/splitless inlets

ID x OD x Length	qty	Similar to Part #	cat.#
3.5 mm x 5.0 mm x 95 mm	5-pk.	Shimadzu 221-48335-01	23321



### Topaz 3.5 mm ID Single Taper Inlet Liner w/ Wool

for Shimadzu 17A, 2010, 2014, and 2030 GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	cat.#
3.5 mm x 5.0 mm x 95 mm	Quartz Wool	5-pk.	23322



### Topaz 3.5 mm ID Single Taper Inlet Liner w/ Wool

for Shimadzu 17A, 2010, 2014, and 2030 GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	cat.#
3.5 mm x 5.0 mm x 95 mm	Quartz Wool	5-pk.	23336



### Topaz 3.5 mm ID Single Taper Precision Inlet Liner w/ Wool

for Shimadzu 17A, 2010, 2014, and 2030 GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	cat.#
3.5 mm x 5.0 mm x 95 mm	Quartz Wool	5-pk.	23455



### Topaz 3.5 mm ID Straight Inlet Liner

for Shimadzu 17A, 2010, 2014, and 2030 GCs equipped with split/splitless inlets

ID x OD x Length	qty	Similar to Part #	cat.#
3.5 mm x 5.0 mm x 95 mm	5-pk.	Shimadzu 221-41444-01	23318

# Inlet Supplies for Shimadzu GCs

## Topaz Inlet Liners for Shimadzu GCs

### Inlet Liners for Shimadzu 17A, 2010, 2014, and 2030 GCs equipped with split/splitless inlets



#### Topaz 3.5 mm ID Straight Inlet Liner w/ Wool

for Shimadzu 17A, 2010, 2014, and 2030 GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	cat.#
3.5 mm x 5.0 mm x 95 mm	Quartz Wool	5-pk.	23319



#### Topaz 3.5 mm ID Straight Inlet Liner w/ Wool

for Shimadzu 17A, 2010, 2014, and 2030 GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
3.5 mm x 5.0 mm x 95 mm	Quartz Wool	5-pk.	Shimadzu 220-90784-00	23458



#### Topaz 3.5 mm ID Uniliner Inlet Liner w/ Wool

for Shimadzu 17A, 2010, 2014, and 2030 GCs equipped with split/splitless inlets

ID x OD x Length	Packing	qty	cat.#
3.5 mm x 5.0 mm x 95 mm	Quartz Wool	5-pk.	23459

### Inlet Liners for Shimadzu 2010 and 2030 GCs equipped with PTV inlets



#### Topaz 1.5 mm ID Straight Inlet Liner

for Shimadzu 2010 and 2030 GCs equipped with PTV inlets

ID x OD x Length	qty	cat.#
1.5 mm x 3.5 mm x 95 mm	10-pk.	23471



#### Topaz 1.5 mm ID Straight Inlet Liner w/ Wool

for Shimadzu 2010 and 2030 GCs equipped with PTV inlets

ID x OD x Length	Packing	qty	cat.#
1.5 mm x 3.5 mm x 95 mm	Quartz Wool	10-pk.	23472

### Inlet Liners for Shimadzu 17A GCs equipped with PTV inlets



#### Topaz 1.6 mm ID Straight Inlet Liner w/ Wool

for Shimadzu 17A GCs equipped with PTV inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
1.6 mm x 4.0 mm x 95 mm	Quartz Wool	5-pk.	Shimadzu 225-09212-01	23435

COLUMN INSTALLS THIS END



## Merlin Microseal Septa

for Shimadzu GCs

- Eliminates septum coring and prolongs septum life.
- Consistently low needle-insertion force.
- Simple installation with no injection port modification.
- Smaller diameter to accept 23-gauge needles and SPME fibers.
- 400 °C max injection port temperature.

The advantages of the Merlin Microseal septum include elimination of septum coring, longer life, and consistently low needle-insertion force. The Microseal septum incorporates two separate sealing mechanisms. These sliding seals eliminate septum coring and the resulting accumulation of septum crumbs in the injection port liner.

The Microseal septum uses a 23-gauge (0.63 mm, 0.025") needle or probe with a blunt, truncated conical tip. Because the syringe plunger end details are determined by manual or autosampler compatibility, often a removable needle syringe is an effective way to match both of these requirements. Installation is simple, requiring no modification of the injection port.

Description	Vendor cat.#	qty.	cat.#
General-Purpose Kit (3 to 100 psi) for Shimadzu GCs Includes nut (1); adaptor (1); O-ring (1); general-purpose (#410) Microseals (2)	61-12	kit	22972



22972

## Merlin Microseal Replacement Septa

Type	Vendor cat.#	Similar to Part #	ea./cat.#
Microseal for 26 gauge or 23/26 gauge tapered needles (5 to 100 psi)	610		22264
Microseal for Traditional SPME Fiber Applications (3 to 100 psi)	21-01	Supelco/Millipore Sigma 24818-U	22782
General-Purpose Microseal (most applications, 3 to 100 psi)	410	Agilent 5182-3444; PerkinElmer N9303345; Supelco/Millipore Sigma 24816-U	22812
Low-Pressure Microseal (1 to 45 psi)	310	Agilent 5181-8815; Supelco/Millipore Sigma 22583	22815
Microseal for 1.1 mm SPME Arrow Applications (3 to 100 psi)	1100		23232
Microseal for 1.5 mm SPME Arrow Applications (3 to 100 psi)	1500		23233



22812

## Viton O-Rings

for Shimadzu 17A, 2010, 2014, and 2030 GCs

Description	Material	Max Temp	qty.	Similar to Part #	cat.#
O-Rings for Shimadzu 17A, 2010, 2014, and 2030 GCs	Viton	250 °C	10-pk.	Shimadzu 036-11203-84	24899



24899



22182

## Make Life Easier (MLE) Capillary Tool Kit

for Shimadzu GCs

Everything you need in one complete kit!

Includes:

- Capillary installation gauge for Shimadzu GCs
- Inlet wrench for Shimadzu GCs
- 1/8", 3/16", and 1/4" nylon brushes
- 1/4", 3/8", and 3/16" stainless steel wire tube brushes
- Stainless steel surface brush
- 6 stainless steel jet reamers/ferrule removers (0.25–0.65 mm OD)
- 1/4" x 5/16" open end wrench
- 3/8" x 7/16" open end wrench
- 6 mm x 7 mm open end wrench
- 8 mm x 10 mm open end wrench
- 16 mm x 17 mm open end wrench
- Slide-lock tweezers
- Scoring wafers
- Inlet liner removal tool
- Septum puller
- Mini wool puller/insert tool
- 4-inch tapered needle file
- 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)

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



27220

## Tool-free GC Column Installation Kit

for Shimadzu 17A, 2010, 2014, and 2030 GCs

Includes inlet adaptor, retaining nut, back washer, and hot swap column nut.

- Makes column installation quicker and easier.
- Provides a leak-free seal for all applications.
- Siltek-treated version available for increased inertness.
- Meets or exceeds original manufacturer's performance.

Description	Includes	Instrument	qty.	cat.#
Tool-free GC Column Installation Kit	inlet adaptor, retaining nut, back washer, and hot swap column nut	for Shimadzu 17A, 2010, 2014, and 2030 GCs	kit	27220
Tool-free GC Column Installation Kit (Siltek Treated)	Siltek-treated inlet adaptor, retaining nut, back washer, and hot swap column nut	for Shimadzu 17A, 2010, 2014, and 2030 GCs	kit	27221



## Inlet Adaptor

for Shimadzu 17A, 2010, 2014, and 2030 GCs

- Makes column installation quicker and easier.
- Provides a leak-free seal for all applications.
- Siltek-treated version available for increased inertness.
- Meets or exceeds original manufacturer's performance.

Note: This part differs from the Shimadzu OEM version and must be used with the hot swap column nut, (cat. #27224).

Description	Instrument	qty.	Similar to Part #	cat.#
Inlet Adaptor	for Shimadzu 17A, 2010, 2014, and 2030 GCs	ea.	Shimadzu 221-42998-00	27222
Inlet Adaptor (Siltek Treated)	for Shimadzu 17A, 2010, 2014, and 2030 GCs	ea.	Shimadzu 221-42998-00	27223



## Hot Swap Column Nut for 1/16" Fittings

- Change your capillary column while the injector is still hot—without burning your fingers.
- Reduced instrument downtime—no need to wait for injector parts to cool down.

Note: For proper operation, oven fan must be kept operational during change out or risk of burns may occur.

Description	qty.	cat.#
Hot Swap Column Nut for 1/16" Fittings	ea.	27224

Note: We recommend you use this product with the capillary installation gauge, (cat.# 27227).



27224

## Retaining Nut

for Shimadzu 17A, 2010, 2014, and 2030 GCs

Meets or exceeds original manufacturer's performance.

Description	Instrument	qty.	Similar to Part #	cat.#
Retaining Nut	for Shimadzu 17A, 2010, 2014, and 2030 GCs	ea.	Shimadzu 201-30008-00	27225



27225

## Back Washer

for Shimadzu 17A, 2010, 2014, and 2030 GCs

Meets or exceeds original manufacturer's performance.

Description	Instrument	qty.	Similar to Part #	cat.#
Back Washer	for Shimadzu 17A, 2010, 2014, and 2030 GCs	ea.	Shimadzu 201-30051-84	27226



27226

## Capillary Installation Gauge for 1/16" Fittings

- Improved design allows tool-free operation.
- Seats ferrules onto column for consistent installations.
- Prevents crushed column ends.
- High-quality, stainless-steel construction.

Note: Best used with hot swap column nut, (cat.# 27224).

Description	qty.	cat.#
Capillary Installation Gauge for 1/16" Fittings	ea.	27227



27227

# Inlet Supplies for Thermo Scientific GCs

## Topaz Inlet Liners for Thermo Scientific GCs

Inlet Liner for Thermo TRACE, 8000 Series and Focus GCs equipped with SSL inlet

COLUMN INSTALLS THIS END



### Topaz 3.0 mm ID Single Taper Inlet Liner

for Thermo TRACE, 8000 Series and Focus GCs equipped with SSL inlets

ID x OD x Length	qty	Similar to Part #	cat.#
3.0 mm x 8.0 mm x 105 mm	5-pk.	Thermo Fisher Scientific 453 20032	23441



### Topaz 3.0 mm ID Single Taper Inlet Liner w/ Wool

for Thermo TRACE, 8000 Series and Focus GCs equipped with SSL inlets

ID x OD x Length	Packing	qty	cat.#
3.0 mm x 8.0 mm x 105 mm	Quartz Wool	5-pk.	23442



### Topaz 3.0 mm ID Straight Inlet Liner

for Thermo TRACE, 8000 Series and Focus GCs equipped with SSL inlets

ID x OD x Length	qty	Similar to Part #	cat.#
3.0 mm x 8.0 mm x 105 mm	5-pk.	Thermo Fisher Scientific 453 20031	23439



### Topaz 3.0 mm ID Straight Inlet Liner w/ Wool

for Thermo TRACE, 8000 Series and Focus GCs equipped with SSL inlets

ID x OD x Length	Packing	qty	cat.#
3.0 mm x 8.0 mm x 105 mm	Quartz Wool	5-pk.	23440



### Topaz 5.0 mm ID Precision Inlet Liner w/ Wool

for Thermo TRACE, 8000 Series and Focus GCs equipped with SSL inlets

ID x OD x Length	Packing	qty	cat.#
5.0 mm x 8.0 mm x 105 mm	Quartz Wool	5-pk.	23327



### Topaz 5.0 mm ID Precision Inlet Liner with Single Taper w/ Wool

for Thermo TRACE, 8000 Series and Focus GCs equipped with SSL inlets

ID x OD x Length	Packing	qty	cat.#
5.0 mm x 8.0 mm x 105 mm	Quartz Wool	5-pk.	23443



### Topaz 5.0 mm ID Single Taper Inlet Liner

for Thermo TRACE, 8000 Series and Focus GCs equipped with SSL inlets

ID x OD x Length	qty	Similar to Part #	cat.#
5.0 mm x 8.0 mm x 105 mm	5-pk.	Thermo Fisher Scientific 453 20033	23325



### Topaz 5.0 mm ID Single Taper Inlet Liner w/ Wool

for Thermo TRACE, 8000 Series and Focus GCs equipped with SSL inlets

ID x OD x Length	Packing	qty	cat.#
5.0 mm x 8.0 mm x 105 mm	Quartz Wool	5-pk.	23326



### Topaz 5.0 mm ID Straight Inlet Liner

for Thermo TRACE, 8000 Series and Focus GCs equipped with SSL inlets

ID x OD x Length	qty	Similar to Part #	cat.#
5.0 mm x 8.0 mm x 105 mm	5-pk.	Thermo Fisher Scientific 453 20030	23323



### Topaz 5.0 mm ID Straight Inlet Liner w/ Wool

for Thermo TRACE, 8000 Series and Focus GCs equipped with SSL inlets

ID x OD x Length	Packing	qty	cat.#
5.0 mm x 8.0 mm x 105 mm	Quartz Wool	5-pk.	23324

COLUMN INSTALLS THIS END



**Topaz 1.0 mm ID Straight Inlet Liner**

for Thermo TRACE 1300/1310 GCs equipped with SSL inlets

ID x OD x Length	qty	Similar to Part #	cat.#
1.0 mm x 6.3 mm x 78.5 mm	5-pk.	Thermo Fisher Scientific 453A1335-UI	23448



**Topaz 1.8 mm ID Straight/SPME Inlet Liner**

for Thermo TRACE 1300/1310 GCs equipped with SSL inlets

ID x OD x Length	qty	Similar to Part #	cat.#
1.8 mm x 6.5 mm x 78.5 mm	5-pk.	Thermo Fisher Scientific 453A0415-UI	23278



**Topaz 4.0 mm ID Cyclo Double Taper Inlet Liner**

for Thermo TRACE 1300/1310 GCs equipped with SSL inlets

ID x OD x Length	qty	Similar to Part #	cat.#
4.0 mm x 6.5 mm x 78.5 mm	5-pk.	Thermo Fisher Scientific 453A1365-UI	23270



**Topaz 4.0 mm ID Cyclo Inlet Liner**

for Thermo TRACE 1300/1310 GCs equipped with SSL inlets

ID x OD x Length	qty	cat.#
4.0 mm x 6.3 mm x 78.5 mm	5-pk.	23269



**Topaz 4.0 mm ID Low Pressure Drop Precision Inlet Liner w/ Wool**

for Thermo TRACE 1300/1310 GCs equipped with SSL inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
4.0 mm x 6.3 mm x 78.5 mm	Quartz Wool	5-pk.	Thermo Fisher Scientific 453A1265-UI	23268



**Topaz 4.0 mm ID Precision Inlet Liner w/ Wool**

for Thermo TRACE 1300/1310 GCs equipped with SSL inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
4.0 mm x 6.3 mm x 78.5 mm	Quartz Wool	5-pk.	Thermo Fisher Scientific 453A1255-UI	23267



**Topaz 4.0 mm ID Single Taper Inlet Liner**

for Thermo TRACE 1300/1310 GCs equipped with SSL inlets

ID x OD x Length	qty	Similar to Part #	cat.#
4.0 mm x 6.5 mm x 78.5 mm	5-pk.	Thermo Fisher Scientific 453A1345-UI	23446



**Topaz 4.0 mm ID Single Taper Inlet Liner w/ Wool**

for Thermo TRACE 1300/1310 GCs equipped with SSL inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
4.0 mm x 6.5 mm x 78.5 mm	Quartz Wool	5-pk.	Thermo Fisher Scientific 453A1925-UI	23447



**Topaz 4.0 mm ID Straight Inlet Liner**

for Thermo TRACE 1300/1310 GCs equipped with SSL inlets

ID x OD x Length	qty	Similar to Part #	cat.#
4.0 mm x 6.3 mm x 78.5 mm	5-pk.	Thermo Fisher Scientific 453A1295-UI	23445



**Topaz 4.0 mm ID Straight Inlet Liner w/ Wool**

for Thermo TRACE 1300/1310 GCs equipped with SSL inlets

ID x OD x Length	Packing	qty	Similar to Part #	cat.#
4.0 mm x 6.3 mm x 78.5 mm	Quartz Wool	5-pk.	Thermo Fisher Scientific 453A2265-UI	23444

# Inlet Supplies for Thermo Scientific GCs

## Topaz Inlet Liners for Thermo Scientific GCs

Inlet Liner for Thermo TRACE GCs equipped with PTV inlets

COLUMN INSTALLS THIS END



### Topaz 1.0 mm ID Straight Inlet Liner

for Thermo TRACE GCs equipped with PTV inlets

ID x OD x Length	qty	Similar to Part #	cat.#
1.0 mm x 2.75 mm x 120 mm	5-pk.	Thermo Fisher Scientific 45322054	23436



### Topaz 2.0 mm ID Baffled Inlet Liner

for Thermo TRACE GCs equipped with PTV inlets

ID x OD x Length	qty	Similar to Part #	cat.#
2.0 mm x 2.75 mm x 120 mm	5-pk.	Thermo Fisher Scientific 453T2845-UI	23438



### Topaz 2.0 mm ID Straight Inlet Liner

for Thermo TRACE GCs equipped with PTV inlets

ID x OD x Length	qty	Similar to Part #	cat.#
2.0 mm x 2.75 mm x 120 mm	5-pk.	Thermo Fisher Scientific 453 22045	23437



22642

### Microseal Septa

for Thermo TRACE 1300 and 1310 GCs

- Eliminates septum coring and prolongs septum life.
- Consistently low needle-insertion force.
- Simple installation with no injection port modification.
- Smaller diameter to accept 23-gauge needles and SPME fibers.
- 400 °C max injection port temperature.

The advantages of the Merlin Microseal septum include elimination of septum coring, longer life, and consistently low needle-insertion force. The Microseal septum incorporates two separate sealing mechanisms. These sliding seals eliminate septum coring and the resulting accumulation of septum crumbs in the injection port liner.

The Microseal septum uses a 23-gauge (0.63 mm, 0.025") needle or probe with a blunt, truncated conical tip. Because the syringe plunger end details are determined by manual or autosampler compatibility, often a removable needle syringe is an effective way to match both of these requirements. No adaptor is required for the Thermo 1300 or 1310 inlet. Installation is simple, requiring no modification of the injection port.

Replacement Microseals for general-purpose (3 to 100 psi), low-pressure (1 to 45 psi), and SPME fiber (3 to 100 psi) applications are available. For use in SPME Arrow applications, a different nut/adaptor kit must be used; see Related Products.

Description	Vendor cat.#	qty.	cat.#
General-Purpose Kit (3 to 100 psi) for Thermo 1300 and 1310 GCs includes: nut (1); general-purpose (#410) Microseals (2)	81-12	kit	22642

Note: Merlin Microseal septa require a 23-gauge (0.63 mm, 0.025") needle or probe with a blunt, truncated conical tip. Compatible syringes and replacement needles are available at [www.restek.com](http://www.restek.com).

## Merlin Microseal Replacement Septa

Type	Vendor cat.#	Similar to Part #	ea./cat.#
Microseal for 26 gauge or 23/26 gauge tapered needles (5 to 100 psi)	610		22264
Microseal for Traditional SPME Fiber Applications (3 to 100 psi)	21-01	Supelco/Millipore Sigma 24818-U	22782
General-Purpose Microseal (most applications, 3 to 100 psi)	410	Agilent 5182-3444; PerkinElmer N9303345; Supelco/Millipore Sigma 24816-U	22812
Low-Pressure Microseal (1 to 45 psi)	310	Agilent 5181-8815; Supelco/Millipore Sigma 22583	22815
Microseal for 1.1 mm SPME Arrow Applications (3 to 100 psi)	1100		23232
Microseal for 1.5 mm SPME Arrow Applications (3 to 100 psi)	1500		23233



22812

## Dual Vespel Ring Inlet Seals

Washerless, Leak-Tight Seals for Thermo TRACE 1300/1310 GCs and PerkinElmer Clarus 590/690 GCs

- Does not require a separate washer.
- Requires less torque to seal.
- Does not require retightening of reducing nut after several oven cycles.
- Extends column lifetime by preventing oxygen from reaching the column.
- Same price as the regular inlet seals with washers.
- Gold plating provides enhanced inertness versus stainless steel.



22245

Our patented dual Vespel ring inlet seal greatly improves injection port performance—it stays sealed, even after repeated temperature cycles, without retightening the reducing nut! This seal features two soft Vespel rings, one embedded in its top surface and the other embedded in its bottom surface. These rings eliminate the need for a washer and ensure very little torque is needed to make a leak-tight seal. The rings will not harm the critical seal in the injector body, or any other surface, and are outside the sample flow path.

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

Description	ID	Material	qty.	Similar to Part #	cat.#
Dual Vespel Ring Inlet Seal for Thermo 1300/1310 GCs and PerkinElmer Clarus 590/690 GCs	0.8 mm	Gold-Plated	2-pk.	PerkinElmer N6551043	22243
	0.8 mm	Gold-Plated	10-pk.	PerkinElmer N6551043	22244
	1.2 mm	Gold-Plated	2-pk.		22245
	1.2 mm	Gold-Plated	10-pk.		22246
	0.8 mm	Siltek-Treated	2-pk.		22247
	0.8 mm	Siltek-Treated	10-pk.		22248
	1.2 mm	Siltek-Treated	2-pk.		22249
	1.2 mm	Siltek-Treated	10-pk.		22250

Patented

## Cross-Disk Inlet Seals

for Thermo TRACE 1300/1310 GCs

All seals include washers. Ideal for high-flow split applications.

Description	ID	Material	qty.	Similar to Part #	cat.#
Cross-Disk Inlet Seal for Thermo 1300/1310 GCs	0.8 mm	Gold-Plated	2-pk.	Thermo Fisher Scientific 290GA083	22235
	0.8 mm	Gold-Plated	10-pk.	Thermo Fisher Scientific 290GA084	22236
	0.8 mm	Siltek-Treated	2-pk.	Thermo Fisher Scientific 290GA093	22239
	0.8 mm	Siltek-Treated	10-pk.	Thermo Fisher Scientific 290GA094	22240



22239

## Inlet Supplies for Thermo Scientific GCs

### Replacement Inlet Seals

for Thermo TRACE 1300/1310 GCs



22231

- Gold plating provides inertness similar to fused silica.
- All seals include washers.

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

ID	Material	Used with	qty.	Similar to Part #	cat.#
0.8 mm	Gold-Plated	Single-Column Installation	2-pk.	Thermo Fisher Scientific 290GA082	22231
0.8 mm	Gold-Plated	Single-Column Installation	10-pk.	Thermo Fisher Scientific 290GA081	22232
1.2 mm	Gold-Plated	0.25/0.32 mm ID Dual-Column Installation	2-pk.	Thermo Fisher Scientific 290GA122	22233
1.2 mm	Gold-Plated	0.25/0.32 mm ID Dual-Column Installation	10-pk.	Thermo Fisher Scientific 290GA121	22234
0.8 mm	Siltek-Treated	Single-Column Installation	2-pk.	Thermo Fisher Scientific 290GA092	22237
0.8 mm	Siltek-Treated	Single-Column Installation	10-pk.	Thermo Fisher Scientific 290GA091	22238

### Make Life Easier (MLE) Capillary Tool Kit

for older Thermo Scientific TRACE GCs, Focus SSL, and PTV injectors (using M4 ferrules)

Everything you need in one complete kit!



22183

Includes:

- Capillary installation gauge for older Thermo Scientific TRACE GCs, Focus SSL, and PTV injectors (using M4 ferrules)
- Liner cap removing tool for Thermo Scientific GCs
- 1/8", 3/16", and 1/4" nylon brushes
- 1/4", 3/8", and 3/16" stainless-steel wire tube brushes
- Stainless-steel surface brush
- 6 stainless-steel jet reamers/ferrule removers (0.25–0.65 mm OD)
- 1/4" x 5/16" open end wrench
- 3/8" x 7/16" open end wrench
- 6 mm x 7 mm open end wrench
- 8 mm x 10 mm open end wrench
- 16 mm x 17 mm open end wrench
- Slide-lock tweezers
- Scoring wafers
- Inlet liner removal tool
- Septum puller
- Mini wool puller/insertor tool
- 4" tapered needle file
- Flashlight
- Mini hand drill set
- 15 cm compact steel ruler
- Pocket magnifier
- High-temperature string (1 m)
- Pipe cleaner (12")
- Cotton tip swabs (pk. of 25)

Description	qty.	cat.#
MLE Capillary Tool Kit for older Thermo Scientific TRACE GCs, Focus SSL, and PTV injectors (using M4 ferrules)	kit	22183

### Liner Cap Removing Tool

for Thermo Scientific GCs: Focus GC, TRACE GC Ultra & TRACE GC x GC

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



24937

Description	Instrument	qty.	Similar to Part #	cat.#
Liner Cap Removing Tool	for Thermo Scientific GCs	ea.	Thermo Fisher Scientific 205 070 10	24937



**Notes:**

## General Instrument Supplies and Tools



22187

### Flashlight

This high-power, 170-lumen LED light features a rotating magnetic clip that attaches securely to give you convenient, hands-free lighting in almost any location. The reinforced plastic body design is water- and impact-resistant, making it reliable and virtually indestructible.

Description	qty.	cat.#
Flashlight	ea.	22187



21325

### GC Installation Kit

This kit contains the tubing and fittings needed to add an additional GC to your lab bench. Kit includes: tubing cutter, one 1/8-inch x 1/4-inch reamer, one 1/4-inch x 1/8-inch brass tube end reducer, one 7/16-inch wrench, one 1/2-inch wrench, four 1/8-inch brass tees, ten 1/8-inch brass nuts, ten brass front and back ferrules, and 50 feet (15.2 meters) of our instrument-grade cleaned 1/8-inch copper tubing.

Description	qty.	cat.#
GC Installation Kit	kit	21325



20116

### Ceramic Scoring Wafer

Eight straight edges for cutting both fused silica and metal MXT tubing.

Description	qty.	Similar to Part #	cat.#
Ceramic Scoring Wafers	5-pk.	Agilent 5181-8836	20116

## Less Worry & Lower Costs

Set up a standing (a.k.a. blanket) order for the liners, septa, seals, and other inlet supplies—even columns and reference standards—that you use on a regular basis. You'll spend less and you won't need to worry about remembering to place resupply orders on time for preventative GC inlet maintenance.

Contact Restek or your local Restek representative today to set up your standing order.

[www.bgb-info.com/restek](http://www.bgb-info.com/restek)



## Restek Electronic Leak Detector

New and improved! Prevent small leaks from causing big problems with a Restek leak detector.

### Features & benefits include:

- Detects a broad range of gases.
- Audible tone and LED display indicate the severity of a leak.
- Can be operated during charging or used up to 12 hours between charges.
- Ergonomic, handheld design.
- Rugged side grips for added durability.
- Handy probe storage for cleanliness and convenience.
- Automatic shutoff.
- A convenient carrying and storage case.
- Easy-to-clean probe assembly.
- A universal AC power adaptor (U.S., UK, Europe, Australia, Japan).
- USB charging cable.

Backed by a one-year warranty, the Restek leak detector is the industry standard for performance and affordability in handheld leak detectors.



28500

### Leak Detector Specifications

Detectable Gases: Helium, nitrogen, argon, carbon dioxide, hydrogen\*  
 Battery: Rechargeable nickel-metal hydride (NiMH) internal battery pack (12 hours normal operation)  
 Ambient Temperature: 50–98.6 °F (10–37 °C)  
 Humidity Range: 0–97%  
 Warranty: One year  
 Certification/Compliance: CE (EU, Korea, Japan, Australia); CSA/UL tested, not listed; WEEE; CEC; China RoHS 2; UKCA Indoor Use Only

### Limits of Detection

These gases can be detected with the Restek electronic leak detector at the following leak rates:  
 Minimum Detectable Gas Limits and Indicating LED Color:  
 Helium,  $1.0 \times 10^{-5}$ , red LED  
 Hydrogen\*,  $1.0 \times 10^{-5}$ , red LED  
 Nitrogen,  $1.4 \times 10^{-3}$ , yellow LED  
 Argon,  $1.0 \times 10^{-4}$ , yellow LED  
 Carbon dioxide,  $1.0 \times 10^{-4}$ , yellow LED  
 Gas detection limits measured in atm cc/sec.

### Restek's Competitive Advantage: Comparing Leak Detectors

	Restek Leak Detector	Agilent G3388B	GOW-MAC 21-070 (Mini)
Battery rating	12 hours normal operation	5 hours normal operation	8 hours normal operation
Battery type	NiMH	Lithium ion	Nickel cadmium
Leak indicator	Incremental visual (LEDs) Incremental audible	Incremental visual (LCD & LED) Step audible	Incremental visual (LEDs) Audible at maximum
Helium leak sensitivity	$1 \times 10^{-5}$ cc/sec	$1 \times 10^{-4}$ cc/sec (standard range) $1 \times 10^{-5}$ cc/sec (high range)	$1 \times 10^{-5}$ cc/sec
Weight	252 grams	95 grams	476 grams
Handheld?	Yes	Yes	No

Description	Includes	qty.	cat.#
Restek Electronic Leak Detector	carrying case, universal AC power adaptor [U.S., UK, Europe, Australia, Japan], 6-ft USB charging cable	ea.	28500
Small Probe Adaptor for Leak Detector		ea.	22658
Dynamic Duo Combo Pack (Restek Leak Detector and ProFLOW 6000 Flowmeter)	Restek Electronic Leak Detector (cat.# 28500) & ProFLOW 6000 Flowmeter (cat.# 22656)	kit	22654
Soft-Sided Storage Case for Restek Leak Detector or ProFLOW 6000 Flowmeter		ea.	22657
6-ft USB charging cable		ea.	28501
Charging Kit	6-ft USB charging cable and universal AC power adaptor [U.S., UK, Europe, Australia, Japan]	kit	28502



22658



22657

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

\*Caution: The Restek electronic leak detector should only be used 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. When using it to detect hydrogen, the Restek electronic leak detector may only be used for determining trace amounts in a GC environment.



28502

# General Instrument Supplies and Tools

## Thermolite Plus Septa

- Usable to 350 °C inlet temperature.\*
- Ultra-low bleed minimizes background signal.
- New plasma coating eliminates sticking in the injection port.
- Precision molding ensures consistent, accurate fit.
- Septa have a CenterGuide design to minimize coring. (Not available on 6 mm, 7 mm, 8 mm, 9.5 mm, 10 mm, and Shimadzu plug.)
- 5 mm septa are partially predrilled for improved puncturability.
- Preconditioned and ready to use.
- Packaged in ultra-clean blister packs.
- Each batch GC-FID tested.



### 5 mm Thermolite Plus Septa

Diameter	qty.	Similar to Part #	cat.#
5 mm ( $\frac{3}{16}$ " ), with CenterGuide, predrilled	50-pk.	Agilent 5183-4760 (50-pk.)	23860
5 mm ( $\frac{3}{16}$ " ), with CenterGuide, predrilled	100-pk.	Agilent 5183-4760 (50-pk.)	23861

### 6 mm Thermolite Plus Septa

Diameter	qty.	cat.#
6 mm ( $\frac{1}{4}$ " )	50-pk.	23874

### 7 mm Thermolite Plus Septa

Diameter	qty.	cat.#
7 mm	50-pk.	23875

### 8 mm Thermolite Plus Septa

Diameter	qty.	cat.#
8 mm	50-pk.	23876

### 9 mm Thermolite Plus Septa

Diameter	qty.	Similar to Part #	cat.#
9 mm, with CenterGuide	50-pk.	Agilent 8010-0201	23862
9 mm, with CenterGuide	100-pk.	Agilent 8010-0202	23863

### 9.5 mm Thermolite Plus Septa

Diameter	qty.	Similar to Part #	cat.#
9.5 mm ( $\frac{3}{8}$ " )	50-pk.	Agilent 8010-0203, 8010-0204 (100-pk.)	23877

### 10 mm Thermolite Plus Septa

Diameter	qty.	Similar to Part #	cat.#
10 mm	50-pk.	Agilent 8010-0205, 8010-0206 (100-pk.)	23878

### 11 mm Thermolite Plus Septa

Diameter	qty.	Similar to Part #	cat.#
11 mm ( $\frac{7}{16}$ " ), with CenterGuide	50-pk.	Agilent 5183-4759; PerkinElmer N6621028	23864
11 mm ( $\frac{7}{16}$ " ), with CenterGuide	100-pk.	Agilent 5183-4759-100, 5190-3158, 8010-0208, 8010-0216	23865

### 11.5 mm Thermolite Plus Septa

Diameter	qty.	Similar to Part #	cat.#
11.5 mm, with CenterGuide	50-pk.	Agilent 8010-0209	23866
11.5 mm, with CenterGuide	100-pk.	Agilent 8010-0210	23867

### 12.7 mm Thermolite Plus Septa

Diameter	qty.	Similar to Part #	cat.#
12.7 mm ( $\frac{1}{2}$ " ), with CenterGuide	48-pk.	Agilent 8010-0211 (24-pk.), 8010-0212	23868

### 17 mm Thermolite Plus Septa

Diameter	qty.	Similar to Part #	cat.#
17 mm, with CenterGuide	48-pk.	Agilent 8010-0213 (24-pk.), 8010-0214	23870

### Shimadzu Plug Thermolite Plus Septa

Diameter	qty.	Similar to Part #	cat.#
Shimadzu Plug	50-pk.	Agilent 8010-0215	23872
Shimadzu Plug	100-pk.	Agilent 8010-0216	23873

Note: Due to differences in inlet design, the actual septum temperature for a given inlet set point can vary by manufacturer. Restek recommends using only BTO septa in older Thermo TRACE and Focus GCs. For Thermo TRACE 1300/1310 GCs, this recommendation does not apply; septa can be used to their maximum recommended temperature.

\*For 17 mm inlets, the maximum temperature for Thermolite Plus septa is 300 °C.

## Premium Non-Stick BTO Septa

- Usable to 400 °C inlet temperature.\*
- New plasma coating eliminates sticking in the injection port.
- Precision molding ensures consistent, accurate fit.
- Septa have a CenterGuide design to minimize coring. (Not available on 9.5 mm, 10 mm, and Shimadzu Plug.)
- 5 mm and 11 mm septa are partially predrilled.
- Preconditioned and ready to use.
- Packaged in ultra-clean blister packs.\*\*
- Each batch GC-FID tested.
- Bleed and temperature optimized; ideal for demanding GC and GC-MS applications.



### 5 mm Premium Non-Stick BTO Septa

Diameter	qty.	Similar to Part #	cat.#
5 mm, with CenterGuide, predrilled	50-pk.	Agilent 5181-1260, 5183-4758	27082
5 mm, with CenterGuide, predrilled	100-pk.		27083

### 9 mm Premium Non-Stick BTO Septa

Diameter	qty.	Similar to Part #	cat.#
9 mm, with CenterGuide	50-pk.	Grace 15129, 8603937	27084
9 mm, with CenterGuide	100-pk.		27085

### 9.5 mm Premium Non-Stick BTO Septa

Diameter	qty.	Similar to Part #	cat.#
9.5 mm (3/8")	50-pk.	Grace 15131, 2106410	27086
9.5 mm (3/8")	100-pk.		27087

### 10 mm Premium Non-Stick BTO Septa

Diameter	qty.	cat.#
10 mm	50-pk.	27088
10 mm	100-pk.	27089

### 11 mm Premium Non-Stick BTO Septa

Diameter	qty.	Similar to Part #	cat.#
11 mm (7/16"), with CenterGuide, predrilled	50-pk.	Agilent 5181-3383-50, 5183-4757, 5183-4761; Grace 15132, 8603938; Thermo Fisher Scientific 31303233	27090
11 mm (7/16"), with CenterGuide, predrilled	100-pk.	Agilent 5183-4757-100, 5183-4759-100	27091

### 11.5 mm Premium Non-Stick BTO Septa

Diameter	qty.	cat.#
11.5 mm, with CenterGuide	50-pk.	27092
11.5 mm, with CenterGuide	100-pk.	27093

### 12.7 mm Premium Non-Stick BTO Septa

Diameter	qty.	cat.#
12.7 mm (1/2"), with CenterGuide	50-pk.	27094

\*\*12.7 mm and 17 mm septa packaged in precleaned glass jars.

### 17 mm Premium Non-Stick BTO Septa

Diameter	qty.	Similar to Part #	cat.#
17 mm, with CenterGuide	50-pk.	Grace 15133, 8603939	27096
17 mm, with CenterGuide	100-pk.		27097

### Shimadzu Plug Premium Non-Stick BTO Septa

Diameter	qty.	Similar to Part #	cat.#
Shimadzu Plug	50-pk.		27098
Shimadzu Plug	100-pk.	Grace 15134, 2106411	27099

Note: Due to differences in inlet design, the actual septum temperature for a given inlet set point can vary by manufacturer. Restek recommends using only BTO septa in older Thermo TRACE and Focus GCs. For Thermo TRACE 1300/1310 GCs, this recommendation does not apply; septa can be used to their maximum recommended temperature.

\*For 17 mm inlets, the maximum temperature for BTO septa is 330 °C. For all injectors, minimum recommended operating temperature for BTO septa is 250 °C.

\*\*12.7 mm and 17 mm septa packaged in precleaned glass jars.

## Tips for Handling Septa

All GC septa, regardless of their composition, puncturability, or resistance to thermal degradation, will be a source of problems if they are mishandled. Always use clean forceps, or wear clean powderless or cotton gloves when handling septa. Do not handle them with bare fingers or with powdered latex gloves—contaminants such as finger oils, perfumes, make-up, fingernail polish, skin creams, hand soaps, and talcum can be absorbed into the septum and will bleed out during your analyses.

Also, always follow septum and instrument manufacturer's recommendations when installing a septum. Overtightening a septum nut will invariably reduce septum lifetime by increasing coring and splitting problems.

For more tips on preventing GC septum problems, visit [www.restek.com/septum-choice](http://www.restek.com/septum-choice)



## General Instrument Supplies and Tools



26262

### The Claw and The Claw Holder Kit

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

Never again will you 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.#
The Claw	ea.	26261
The Claw Holder Kit (includes The Claw and holder)	kit	26262



24658

### 4.0 mL WISP 48 Snap Seal 13 mm Crimp-Top Vial, 15 x 45 mm (vial only)

Description	Type	Volume	Color	Size	qty.	cat.#
WISP 48 Snap Seal Vial,	13 mm Crimp-Top	4.0 mL	Clear	15 x 45 mm	100-pk.	24658
w/White Graduated Marking Spot	13 mm Crimp-Top	4.0 mL	Clear	15 x 45 mm	1000-pk.	24659



20181

No more burned fingers!

### Inlet Liner Removal Tool

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

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



20117

### Septum Puller

- Use hooked end for removing septa and O-rings; pointed end works well for removing stuck ferrules or debris.
- Keep several on hand in your laboratory for other uses, too.

Description	qty.	cat.#
Septum Puller	ea.	20117

**Notes:**

The GC inlet supplies and tools you need are at  
[www.bgb-info.com/restek-gc-accessories](http://www.bgb-info.com/restek-gc-accessories)

**BGB** GC|LC  
MS|CE

DR-BGB-2304

[www.bgb-shop.com](http://www.bgb-shop.com)

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