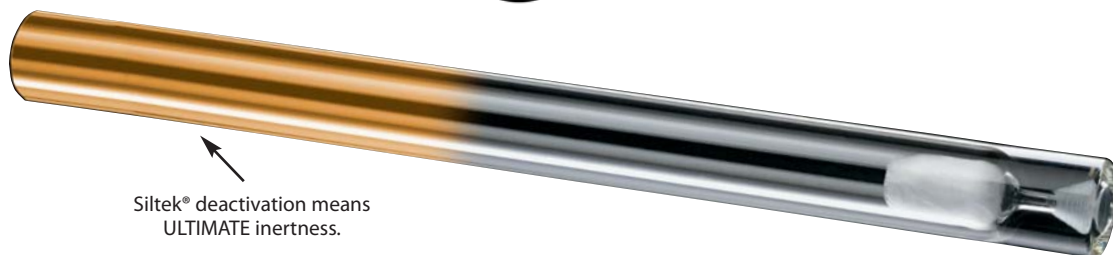


Liner Anatomy



Siltek® deactivation means
ULTIMATE inertness.



Let's Begin

To correctly diagnose which inlet liner is right for your application, let's first consider the method of sample introduction.

Split Injections

Split injections are a fast, efficient way to transfer a portion of the sample onto the column for analysis. Split injection is often used for dirty samples or highly concentrated samples.

Splitless Injections

Splitless injection involves an initial hold time where the split vent flow is turned off and the incoming sample flow is forced onto the column. It is an excellent technique for low concentration samples and commonly is used in drug screening and pesticide residue methods.

Direct Injections

Direct injection is an alternative to splitless injection. It is an excellent technique for trace samples, especially those that are prone to degradation inside the injection port.

Programmable Temperature Vaporization (PTV)

PTV injection techniques offer a means to inject a sample into a cold injection port that can be rapidly heated to transfer analytes into the GC. These techniques can reduce sample degradation, increase reproducibility, and allow for larger volumes of sample to be introduced, ultimately increasing sensitivity.

Gaseous Sample Introduction

Purge and trap and headspace techniques that sweep a gaseous sample through the injection port onto the column require fast flow through the liner and very small liner volumes to minimize band broadening effects. Split flow operation is typically used to achieve this effect.



Deactivation

Liners and their packing materials need to provide highly inert pathways to guard against sample adsorption (reversible or irreversible) and sample degradation. There are three prominent deactivation options.

Siltek® Deactivation

Siltek® deactivated liners offer the most chemically inert sample pathway—perfect for low-level analyses or highly active compounds, where preventing sample loss and degradation is critical.

Intermediate Polarity (IP) Deactivation

IP deactivation offers good recovery and reproducibility for both polar and nonpolar compounds—making IP an excellent general-purpose deactivation.

Base Deactivation (BD)

Base deactivation (BD) is ideal for the analysis of basic compounds, such as amines and basic drugs. It prevents analyte adsorption which manifests as either irreproducible results or peak tailing. Couple BD liners with BD columns for best results.

restek **exclusive!**

Siltek® treated metal inlet liners



Packing Options

Proper selection of liner packing material and position improves sample vaporization, prevents nonvolatile compounds from entering the column, and permits large volume injections in programmable temperature vaporization applications. Sample characteristics and injection technique will dictate packing use. Analyses of high molecular weight analytes, especially in split mode, benefit from the use of packing.



Packing Material

Glass wool is the most common packing material. Properly deactivated glass wool provides an inert means of effectively vaporizing a sample, improving reproducibility and decreasing high molecular weight discrimination. An alternative to glass wool is Carbofrit packing (highly dense and inert).

Packing Position

- Packing placed near the bottom of the liner prevents nonvolatile compounds and septum particles from entering the column. Liners designed for splitless applications often have packing near the bottom, since the long analyte residence time in the liner is usually adequate to vaporize the sample.
- Packing near the middle of the liner enhances vaporization and can improve reproducibility. Precision™ liners are designed with built-in stops, keeping the wool properly positioned when wiping the needle. This ensures precise sample delivery each time. Good needle maintenance is critical as a burred needle can pull the packing out of position, eliminating its effectiveness.



Precision™ liners keep wool in position injection after injection.

Packing in PTV Injections

Packing material used in liners for PTV injection can serve as vaporization aides and a means of trapping nonvolatile compounds. Additionally, the packing can act as a reservoir for large volume injections, making it possible to inject greater than 100µL of sample.

Volume and Inner Diameter

Sample expansion volume and linear velocity should be considered when choosing liner dimensions.

Sample Expansion Volume

When a liquid sample is vaporized inside an inlet liner, its volume expands considerably. Care should be taken to match the effective liner volume and the expanded volume of the injected sample. If the liner volume is exceeded, the sample will be forced back into the gas lines, causing irreproducible peak areas and sample carryover.



Solvent expansion volumes based on an injection port temperature of 250°C and a 10 psig head-pressure.	Injection Volume (µL)	Expansion Volume (µL)				
		H ₂ O	C ₆ S	CH ₂ Cl ₂	Hexane	Isooctane
For a straight 4mm ID x 78.5mm long liner, the effective liner volume is approximately 500µL.	0.5	710	212	200	98	78
	1.0	1420	423	401	195	155
	2.0	2840	846	802	390	310
	5.0	7100	2120	2000	975	775
	— indicates expansion volume exceeds effective liner volume.					

Linear Velocity

Choosing a liner with a narrow inner diameter will give a faster linear velocity (for a given flow rate), which will move the sample onto the column quickly, improving efficiency and helping keep peak widths narrow. This is particularly important for gaseous samples introduced via purge-and-trap or static headspace techniques, or when 0.18mm, 0.15mm, and 0.10mm ID columns are used.



Geometry

Many inlet liners are designed with special geometries. Generally liner geometries are intended to aid sample vaporization and protect the sample, especially during splitless injections. Additionally for PTV applications, liners provide wettable surface area for large volume injections.

Enhance Vaporization

To avoid molecular weight (MW) discrimination (a phenomenon where high MW compounds are not vaporized efficiently and are therefore under-represented in the analyzed sample), some liners are designed with complex flow paths to aid vaporization.

Cycloplitter®



Laminar Cup



Protect the sample

Some samples are prone to degradation inside of the injector, especially when in contact with hot metal surfaces. Several liners are designed specifically to minimize contact with the injection port.

Gooseneck



Double Gooseneck



Cyclo Double Gooseneck



Some liners combine both features! →

Baffles in PTV Liners

The baffles in PTV liners can act as a means to help vaporize a sample during a hot split or splitless injection, but typically they act as “wells” where liquid sample can be retained during cold injections. In this way, the baffle liners allow for larger volume injections to be made, typically on the order of 10 μ L.

Direct Injections with Uniliner® and Drilled Uniliner® Inlet Liners

Uniliner® and Drilled Uniliner® inlet liners allow a fused silica column to be connected directly to the liner through a seal made between the inner glass wall of the liner and the polyimide coating on the outside of the column.

This configuration maximizes the amount of sample transferred to the GC column and is a good choice for trace analyses. It also minimizes sample exposure to hot injection port parts, potentially improving sample stability and reproducibility.

Use the Drilled Uniliner® inlet liner with the hole near the bottom for semivolatile analyses or when compounds of interest could be affected by a tailing solvent peak. Use the Drilled Uniliner® inlet liner with the hole near the top for chlorinated pesticides analyses, aqueous injections, and analyses in which the compounds of interest elute away from the solvent peak.



Drilled Uniliner® with hole near bottom



Drilled Uniliner® with hole near top

Instruments equipped with electronic pressure control must use Drilled Uniliner® inlet liners.



Liner Maintenance

Inlet liners are key to injection port maintenance and need to be changed regularly to avoid the following problems:

- Sample degradation resulting in poor response.
- Sample adsorption resulting in poor peak shape (tailing).
- Sample discrimination.
- Irreproducibility.
- Extraneous peaks from contamination or cored septum particles.

Be sure to condition your liners at 20°C higher than the operating inlet temperature for a minimum of 10 minutes to prepare them for use.

Liner Deactivations Available from Restek**Intermediate Polarity (IP) Deactivation**

- Phenylmethyl-deactivated surface for better recovery of polar and nonpolar compounds.
- Compatible with most common solvents.
- Our standard deactivation—every Restek liner is IP deactivated unless otherwise requested.

Base Deactivation

- Excellent inertness for basic compounds.
- Recommended for use with Rtx[®]-5 Amine, Rtx[®]-35 Amine, and Stabilwax[®]-DB columns.

Siltek[®] Deactivation

- Revolutionary, proprietary deactivation for difficult matrices and reactive compounds.
- Inertness retained over a wide sample range.
- Minimal bleed.
- Ideal for chlorinated pesticide analysis.
- Recommended for use with Rtx[®]-CLPesticides, Stx[™]-CLPesticides, and Rtx[®]-TNT columns.

Siltek[®] Deactivation for Liners

- Maximizes the inertness of the sample pathway.
- Minimizes breakdown.
- Low bleed.
- Thermally stable.
- “Clean and green”—manufactured without the use of harmful organic solvents.

Our patented Siltek[®] deactivation process for liners produces a highly inert glass surface that features high temperature stability, extreme durability, and low bleed. Try Siltek[®] liners, guard columns, and connectors for better recovery of sample analytes.

For Siltek[®] deactivated inlet liners, add the corresponding suffix number to the liner catalog number.

qty.	Siltek Liner	Siltek Liner w/Wool	Siltek Liner w/CarboFrit
each	-214.1 enquire addl. cost	-213.1 enquire addl. cost	-216.1 enquire addl. cost
5-pk.	-214.5 enquire addl. cost	-213.5 enquire addl. cost	-216.5 enquire addl. cost
25-pk.	-214.25 enquire addl. cost	-213.25 enquire addl. cost	-216.25 enquire addl. cost

Base-Deactivated Inlet Liners

For base-deactivated inlet liners, add the corresponding suffix number to the liner catalog number.

qty.	Base-Deactivated Liner	Base-Deactivated Liner w/ Base-Deactivated Wool	Base Deactivated Liner w/CarboFrit
each	-210.1 enquire addl. cost	-211.1 enquire addl. cost	-229.1 enquire addl. cost
5-pk.	-210.5 enquire addl. cost	-211.5 enquire addl. cost	-229.5 enquire addl. cost
25-pk.	-210.25 enquire addl. cost	-211.25 enquire addl. cost	-229.25 enquire addl. cost



All liners are
100%
deactivated

All liners are shipped intermediate polarity (IP) deactivated unless otherwise requested.



Siltek[®] Coated Liners

Ideal for amines and basic compounds!

**Minimizing Backlash**

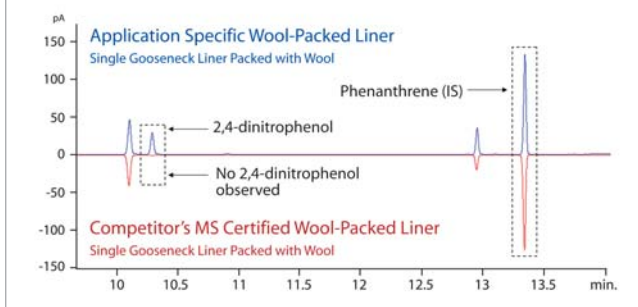
Backlash occurs when the volume of the sample vapor exceeds the effective volume of the injection liner. This phenomenon causes poor reproducibility, tailing analyte peaks, a broad solvent peak, ghost peaks, and nonlinear responses. You can minimize backlash by using a solvent that has a low expansion volume, injecting less sample, installing an injector liner with a larger volume, or reducing the injector temperature.

Application Specific Deactivated Wool

New deactivated wool gives excellent inertness for semivolatiles analysis. The acidic compounds are reactive and can be difficult to quantify with wool placed in the inlet liner. With the new deactivation used for wool, the response of 2,4-dinitrophenol is excellent and an improvement over other competitor deactivated wool for semivolatiles analysis. As shown in Figure 1, the response of 10ng of 2,4-dinitrophenol using the new wool in the liner is 0.21, where the competitive "MS Certified Liner with Wool" liner shows virtually no response.



Figure 1 Response of 10ng of 2,4-dinitrophenol compared to phenanthrene using a flame ionization detector.



To order the new Application Specific Wool in prepacked liners, add the corresponding suffix number to the liner catalog number.

qty.	IP Deactivated Liner with Application Specific Wool	Siltek Liner with Application Specific Wool
each	-231.1 enquire addl. cost	-232.1 enquire addl. cost
5-pk.	-231.5 enquire addl. cost	-232.5 enquire addl. cost
25-pk.	-231.25 enquire addl. cost	-232.25 enquire addl. cost

Deactivated Wool

This deactivated wool is more inert than our traditional fused silica wool. This wool can be used to vaporize a sample in a liner prior to introduction into a capillary column.



Description	qty.	cat.#	price
Deactivated Wool	10 grams	24324	

Base-Deactivated Wool

Ideal for amines and other basic compounds.



Description	qty.	cat.#	price
Base-Deactivated Wool	10 grams	20999	

**please note**

Liner packing materials and their uses in various liners are described on **page 141**.

Prepacked Inlet Liners

Let Restek do the work! Just add the appropriate suffix to the liner catalog number.

qty.	Wool	CarboFrit†	price
ea.	-200.1	-209.1	enquire addl. cost
5-pk.	-200.5	-209.5	enquire addl. cost
25-pk.	-200.25	-209.25	enquire addl. cost

†CarboFrit inserts require a neck greater than 2mm.

CarboFrit™ Inlet Liner Packing Material

- Highly inert.
- Extends analytical column lifetime.
- Enhances reproducibility of split and splitless injection.
- Uniform pore size and consistent packing density guarantee consistent flow through the liner.
- Easy to install in any liner with an ID >3.5mm when using puller-insert tool listed below.*



Add the corresponding suffix number to the liner catalog number.

Description	suffix	price
each	-209.1	enquire addl. cost
5-pk.	-209.5	enquire addl. cost
25-pk.	-209.25	enquire addl. cost

*Liners with IDs less than 3.5mm are difficult to pack. We will pack them on a custom basis (minimum neck ID of 2mm required).

Replacement CarboFrit™ Inserts

Description	qty.	cat.#	price
Frits for liner ID ≤4mm	10-pk.	20295	
Frits for liner ID >4mm	10-pk.	20294	

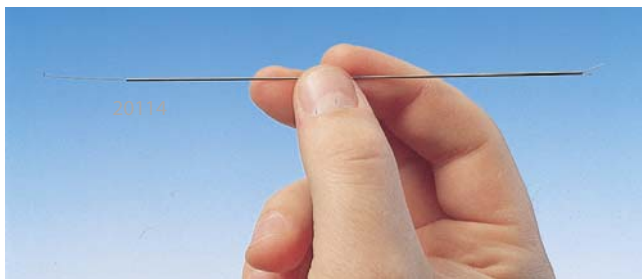
**CarboFrit™ Puller/Inserter Tool**

- Hook end for removing CarboFrit™ inserts.
- Bent end (90°) for inserting CarboFrit™ inserts.

Description	qty.	cat.#	price
CarboFrit Puller/Inserter Tool	ea.	21642	

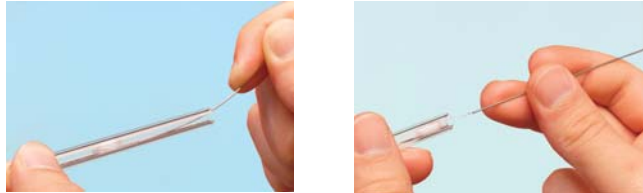
**Use of Packings with Autosampler**

We recommend using an injection port liner with wool or CarboFrit™ packing when making injections with an autosampler. If there is no packing material in the liner, the solvent droplets act like water on a hot iron: they bounce around until vaporized (Leidenfrost phenomenon). Because autosamplers make rapid injections, samples can be incompletely vaporized, leading to nonreproducible peak response and tailing. You can prevent this by using wool or CarboFrit™ packing material in the splitless liner, to provide a surface for the solvent droplets to "sit" on until the heat from the injector vaporizes them.



Mini Wool Puller/Inserter

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



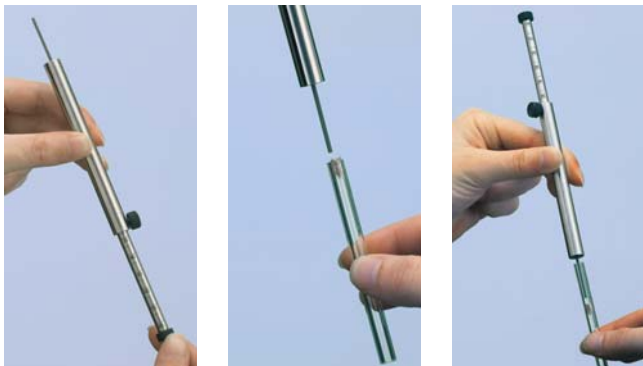
Description	qty.	cat.#	price
Mini Wool Puller/Inserter	2-pk.	20114	



Eliminates user variation!

Inlet Liner Packing Tool

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



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

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

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

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



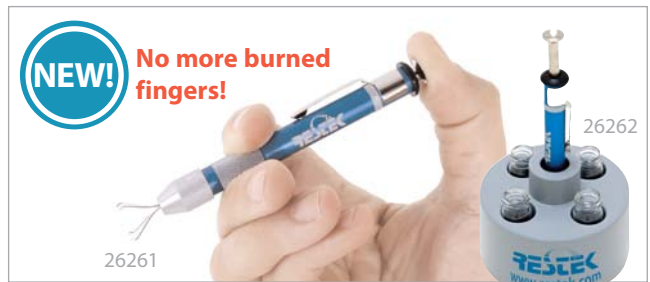
No more burned fingers!

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.#	price
Inlet Liner Removal Tool	3-pk.	20181	



The Claw and The Claw Holder Kit

- Easily removes hot liners from injection ports.
- 4mL vials (not included) can be changed out and disposed of when dirty.

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



















Description	qty.	cat.#	price
The Claw	ea.	26261	
The Claw Holder Kit (includes The Claw and holder)	kit	26262	
4.0mL Clear Vial, White Graduated Marking Spot	100-pk.	24658	



Injector Maintenance

Approximately ninety percent of "bad" chromatography is traceable to problems in the injection port. These problems include contaminated carrier gas, incorrect injector flows, active or dirty sites on inlet seals and liners, improper use of wool, leaks, backflash, discrimination, incorrect injector temperature, poor column installation, and use of the wrong injection technique. To minimize injection port problems, set up a routine maintenance schedule and be sure to investigate the injector first when troubleshooting.

Splitless Liners for Agilent GCs	Benefits/Uses	ID* OD x Length	Similar to Agilent part #	ea.	cat. #	price	25-pk.
					5-pk.		
 2mm Splitless	trace samples < 2µL	2.0mm 6.5mm x 78.5mm	5181-8818 (ea.) 5183-4703 (5-pk.) 5183-4704 (25-pk.)	20712	20713		20714
 4mm Splitless	trace samples > 2µL	4.0mm 6.5mm x 78.5mm	210-3003 (ea.) 210-3003-5 (5-pk.)	20772	20773		20774
 4mm Splitless w/Wool	trace samples > 2µL	4.0mm 6.5mm x 78.5mm	19251-60540 (ea.) 5183-4691 (5-pk.) 5183-4692 (25-pk.)	22400	22401		22402
 2mm Splitless (quartz)	trace samples < 2µL	2.0mm 6.5mm x 78.5mm	18740-80220 (ea.) 5183-4707 (5-pk.)	20914	20915		—
 4mm Splitless (quartz)	trace samples > 2µL	4.0mm 6.5mm x 78.5mm	—	20912	20913		—
 4mm Splitless (quartz) w/Wool	trace samples > 2µL	4.0mm 6.5mm x 78.5mm	—	22403	22404		—
 Gooseneck Splitless (2mm)	trace samples < 2µL	2.0mm 6.5mm x 78.5mm	—	20795	20796		20797
 Gooseneck Splitless (4mm)†	trace samples > 2µL	4.0mm 6.5mm x 78.5mm	5181-3316 (ea.) 5183-4695 (5-pk.) 5183-4696 (25-pk.)	20798	20799		20800
 Gooseneck Splitless (4mm) w/Wool†	trace samples > 2µL	4.0mm 6.5mm x 78.5mm	5062-3587 (ea.) 5183-4693 (5-pk.) 5183-4694 (25-pk.)	22405	22406		22407
 Double Gooseneck Splitless (4mm)	trace, active samples > 2µL	4.0mm 6.5mm x 78.5mm	5181-3315 (ea.) 5183-4705 (5-pk.) 5183-4706 (25-pk.)	20784	20785		20786
 Cyclo Double Gooseneck (2mm)	trace, active, dirty samples < 2µL	2.0mm 6.5mm x 78.5mm	—	20907	20908		—
 Cyclo Double Gooseneck (4mm)	trace, active, dirty samples > 2µL	4.0mm 6.5mm x 78.5mm	—	20895	20896		20997
 Recessed Gooseneck (2mm)**	base easily packs with wool for dirty samples < 2µL	2.0mm 6.5mm x 78.5mm	—	20980	20981		20982
 Recessed Gooseneck (4mm)**	base easily packs with wool for dirty samples > 2µL	4.0mm 6.5mm x 78.5mm	—	20983	20984		20985
 Recessed Gooseneck (4mm) w/Wool**	base easily packs with wool for dirty samples > 2µL	4.0mm 6.5mm x 78.5mm	—	22408	22409		22410
 Recessed Double Gooseneck (4mm)**	trace, active samples > 2µL	4.0mm 6.5mm x 78.5mm	—	20986	20987		20988

C O L U M N I N S T A L L S T H I S E N D

*Nominal ID at syringe needle expulsion point.

**Use with two-hole ferrule for dual-column analysis.

†Use this liner for increased sensitivity.

All liners are
100%
deactivated

All liners are shipped intermediate
polarity (IP) deactivated unless
otherwise requested.



Restek can provide any of the liners shown deactivated according to any of our three proprietary processes, including our highly inert Siltek® coating. The processes are described on **page 140** and ordering information is on **page 143**.



















Packing materials, including wool and CarboFrits™, can be provided in any liner—subject to the liner ID and geometry. Packing materials are described on **page 141** and ordering information is on **pages 143-144**.



Siltek® Treated Liners

C O L U M N I N S T A L L S T H I S E N D

Split Liners for Agilent GCs	Benefits/Uses	ID* OD x Length	Similar to Agilent part#	ea.	cat.# / price 5-pk.	25-pk.
 1mm Split**	for purge & trap inlet splitting or sample <math><1\mu\text{L}</math>	1.0mm 6.3mm x 78.5mm	18740-80200 (ea.) 5183-4709 (5-pk.)	20972	20973	—
 4mm Split w/Wool	universal, use with Agilent 7673 autosampler	4.0mm 6.3mm x 78.5mm	19251-60540 (ea.) 5183-4691 (5-pk.) 5183-4692 (25-pk.)	20781	20782	20783
 Laminar Cup Splitter	high MW compounds	4.0mm 6.3mm x 78.5mm	—	20801	20802	—
 mini-Lam Split	high MW compounds	4.0mm 6.3mm x 78.5mm	—	20990	20991	—
 Cup Splitter	high & low MW compounds	4.0mm 6.3mm x 78.5mm	18740-80190 (ea.) 5183-4699 (5-pk.)	20709	20710	—
 Cyclosplitter	dirty samples, many injections before cleaning required	4.0mm 6.3mm x 78.5mm	—	20706	20707	20708
 2mm Split Precision Liner w/Wool	dirty samples, trace samples	2.0mm 6.3mm x 78.5mm	—	20823	20824	—
 4mm Split Precision Liner w/Wool	dirty samples, trace samples	4.0mm 6.3mm x 78.5mm	210-4004-5 (5-pk.)	21022	21023	20979
 4mm Gooseneck Precision Liner	dirty samples, trace samples	4.0mm 6.3mm x 78.5mm	210-4022-5 (5-pk.)	22983	22984	22985
Split/Splitless Liners for Agilent GCs						
 Low Pressure Drop Liner w/Wool	universal	4.0mm 6.3mm x 78.5mm	—	21032	21033	—
 Low Pressure Drop Liner w/Wool	universal	4.0mm 6.3mm x 78.5mm	5183-4647 (ea.) 5183-4701 (5-pk.)	20994	20995	20996
CIS4 and PTV Liners for Agilent GCs						
 PTV On-Column Liner	allows on-column injection with a 0.53mm ID column	1.7mm 3.0mm x 71mm	—	24976	24977	—
 Straight Glass	general use	2.0mm 3.0mm x 71mm	5183-2036	—	—	21157
 Baffled Glass	active compounds, drugs, pesticides	1.5mm 3.0mm x 71mm	5183-2037	—	—	21704
 Glass w/Wool	large volume injections	2.0mm 3.0mm x 71mm	5183-2038	—	—	21156
SPME Liners for Agilent GCs						
 SPME Liner	ideal for low-volume SPME applications	0.75mm 6.35mm x 78.5mm	—	—	21110	21111

*Nominal ID at syringe needle expulsion point.
**Use this liner for increased sensitivity.

COLUMN INSTALLS THIS END

DI Liners for Agilent GCs** (For 0.25/0.32/0.53mm ID Columns)	Benefits/Uses	ID* OD x Length	Similar to Agilent part #	ea.	cat.# / price 5-pk.	25-pk.
Drilled Uniliner (hole near top)	trace, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm	—	21054	21055	20998
Drilled Uniliner (hole near bottom)	trace, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm	G1544-80730	20756	20771	—
Double Gooseneck Drilled Uniliner (hole near top)	trace, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm	—	20508	20509	—
Double Gooseneck Drilled Uniliner (hole near bottom)	trace, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm	G1544-80700	20954	20989	—
Drilled Cyclo-Uniliner (hole near top)	trace, dirty, high MW, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm	NEW!	22979	22980	—
1mm Uniliner	trace, active samples, samples <1µL	1.0mm 6.3mm x 78.5mm		21052	21053	
Uniliner	trace, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm		20335	20336	
Cyclo-Uniliner	trace, dirty, high MW active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm		20337	20338	
Open-top Uniliner w/Wool	trace, dirty, active samples, high recovery & linearity	4.0mm 6.3mm x 78.5mm		20843	20844	

*Nominal ID at syringe needle expulsion point.

**Hole in Drilled Uniliner liner makes direct injection possible with EPC-equipped Agilent 6890 & 7890 GCs!

tech tip

Drilled Uniliner® Liners

Use the Drilled Uniliner® liner with the hole near the bottom for semivolatiles analysis or when compounds of interest could be affected by a tailing solvent peak. Use the Drilled Uniliner® liner with the hole near the top for chlorinated pesticides analysis, aqueous injections, as well as for analysis in which the compounds of interest elute away from the solvent peak.

All liners are
100% deactivated

All liners are shipped intermediate polarity (IP) deactivated unless otherwise requested.



Restek can provide any of the liners shown deactivated according to any of our three proprietary processes, including our highly inert Siltek® coating. The processes are described on **page 140** and ordering information is on **page 143**.



Packing materials, including wool and CarboFrits™, can be provided in any liner—subject to the liner ID and geometry. Packing materials are described on **page 141** and ordering information is on **pages 143-144**.



Siltek® Treated Liners



Siltek® Metal Inlet Liners for Agilent GCs

- Won't crack, chip, or break like glass liners.
- Excellent response for pesticides, phenols, and other active compounds.

Liner Type (5.2mm ID x 6.3mm OD x 78.5mm)	5-pk.	25-pk.
Cyclo/Single Gooseneck	20974	20975
Single Gooseneck	21702	21703
Cyclosplitter	20726	20729
Split/Splitless w/Wool	21700	21701

Viton® O-Rings for Agilent GCs

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



Description	Max. temp.	Similar to Agilent part #	qty.	cat.#	price
Viton O-Rings for Agilent GCs	250°C	5180-4182	25-pk.	20377	

Graphite O-Rings for Agilent and Varian 1177 Injectors

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



Description	Max. temp.	Similar to Agilent part #	10-pk. cat.#	price	50-pk. cat.#	price
6.35mm ID Graphite O-rings for split liners	450°C	5180-4168	20296		20297	
6.5mm ID Graphite O-rings for splitless liners	450°C	5180-4173	20298		20299	

Liner Seals for CIS4 and PTV



Description	Max. temp.	Similar to Agilent part #	Similar to Gerstel part #	qty.	cat.#	price
Liner Seals for CIS4 and PTV	450°C	5182-9749	007541-005-00	5-pk.	22684	

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



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

Injector/Detector Plug Nuts

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



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



IceBlue® Septa



Thermolite® Septa



BTO® Septa

Septa for Agilent GCs

- Preconditioned and ready to use.
- Packaged in precleaned glass jars.

Now precision molded!

Septum Diameter	25-pk./price	50-pk./price	100-pk./price
Thermolite Septa (usable to 340°C inlet temp.)			
5mm (3/16")	27120	27121	27122
9.5mm (3/8")	27135	27136	27137
10mm	27138	27139	27140
11mm (7/16")	27141	27142	27143

IceBlue Septa (usable to 250°C inlet temp.)			
9.5mm (3/8")		27158	27159
10mm		27160	27161
11mm (7/16")		27162	27163

BTO Septa (usable to 400°C inlet temp.)			
5mm CenterGuide		27100	27101
9.5mm (3/8")		27106	27107
10mm		27108	27109
11mm (7/16") CenterGuide		27110	27111

HANDY septum size chart

Agilent Instrument	Septum Diameter (mm)
5880A, 5890, 6890, 6850, 7890, PTV	11
5700, 5880	9.5/10
On-Column Injection	5

Merlin Microseal Septa for Agilent GCs

- Allow operation from 2 to 100psi (400 Series) or 2 to 30psi (300 Series).
- Maximum temperature—Agilent 7890, 6890, 5890 Series II: 325°C; Agilent 5890A: 300°C.



Nut

Septa

Microseal High-Pressure Septa, 400 Series (100psi)	Merlin #	Similar to Agilent#	cat.#	price
Standard kit (nut, 2 septa)	404	Not offered	22810	
Starter kit (nut, 1 septum)	405	5182-3442	22811	
Nut kit (1 nut, fits 300 & 400 series septa)	403	5182-3445	22809	
High-pressure replacement septum (1 septum)	410	5182-3444	22812	

Microseal Septa, 300 Series (30psi)	Merlin #	Similar to Agilent#	cat.#	price
Standard kit (nut, 2 septa)	304	5181-8833	22813	
Starter kit (nut, 1 septum)	305	5181-8816	22814	
Microseal replacement septum (1 septum)	310	5181-8815	22815	