

Genuine Restek Replacement Parts

Shimadzu GCs



More Parts & Accessories
for More GC Systems

Agilent • Bruker/Varian • PerkinElmer • Shimadzu • Thermo Scientific • And More!

RESTEK

Innovative Chromatography Products

www.restek.com

More Parts & Accessories for More GC Systems

Agilent • Bruker/Varian • PerkinElmer • Shimadzu • Thermo Scientific • And More!

Dear Colleague,

Restek's GC Accessories Team is devoted to bringing you the highest-quality products, delivered on time every time, to help you maximize data reproducibility and minimize instrument downtime—regardless of which brand of instrument you use. From our exceptionally inert Sky® inlet liners on the right to the invaluable Restek Electronic Leak Detector on page 12, Genuine Restek Replacement Parts are designed to meet or even exceed GC manufacturers' already-strict specifications and performance requirements. And of course, as with all Restek products, we also offer exemplary Plus 1 service before and after you order.

Do you have a product suggestion or question about Restek's GC accessories? Feel free to contact one of our team members or your Restek representative today. We look forward to hearing from you!

Sincerely,

Scott Adams

GC Accessories Product Marketing Manager



Scott Grossman
GC Accessories
Chemist

Rob Lindquist
GC Accessories Associate
Product Marketing Manager

Kelli Steindl
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Line Manager

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e-mail us at gcaccpmm@restek.com

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How can we help you today? Contact us...

customer **service**: 1-814-353-1300 (ext. 3) | e-mail: csreps@restek.com

technical **service**: 1-814-353-1300 (ext. 4) | e-mail: support@restek.com

sales representatives: 1-814-353-1300 | e-mail: salesreps@restek.com

3 ways to **order**:

1. **CALL**: 1-800-356-1688 (ext. 3) or 1-814-353-1300 (ext. 3)
Monday–Friday 8:00 a.m.–6:00 p.m. Eastern Time

2. **FAX**: 1-814-353-1309 24 hours a day

3. **ONLINE**: www.restek.com 24 hours a day

Outside the U.S.? Find a distributor at www.restek.com/distributor

Sky[®]

Inlet Liners

Patent pending

True Blue Performance

- Increase accuracy and reproducibility with state-of-the-art deactivation.
- Achieve lower detection limits for a wide range of active compounds.
- Use wool with confidence—quartz wool is deactivated after packing, preventing the loss of sensitive analytes.

When faced with complex choices, simple solutions stand out. Sky[®] inlet liners from Restek use a comprehensive, state-of-the-art deactivation and are the only blue liners on the market—making them an easy-to-recognize solution to common inlet problems.

Sky[®] liners give you the inertness you need for more accurate trace-level results.

The innovative deactivation used for Sky[®] liners results in exceptional inertness for a wide range of analyte chemistries. By reducing active sites and enhancing analyte transfer to the column, these liners increase accuracy and precision, allowing lower detection limits for many active compounds. In addition to improved data quality, you'll benefit from fewer liner changes and less downtime for maintenance.

Selecting the right liner for your application can be a challenging task. Sky[®] inlet liners make the choice simple; the comprehensive deactivation, distinctive color, and availability in popular configurations mean Sky[®] liners are the best choice for optimizing chromatographic performance. Regardless of your application, Sky[®] liners provide reliable inertness and assured performance, day-after-day and analysis-after-analysis.



The Story Behind Sky[®] Liners

For over 25 years, Restek's vision has been to be the company chromatographers trust. This philosophy is the cornerstone of our business, and it's the reason our chemists and engineers are dedicated to developing innovative, best-in-class products like Sky[®] liners. As chromatographers, we understand your needs and strive to develop and deliver products that make your life easier.

With Sky[®] liners, our goal was to create a state-of-the-art deactivation that provides superior performance. But why did we make them blue? Restek has always been associated with the color blue; to us, it signifies strength, innovation, and excellence. We made Sky[®] liners blue because it represents the technological advancements and unmatched quality that define Restek products. Choose blue—the best choice for dependable results.

Simple Solutions:

Inert Sky® Inlet Liners Improve Accuracy and Precision for a Wide Range of Analytes

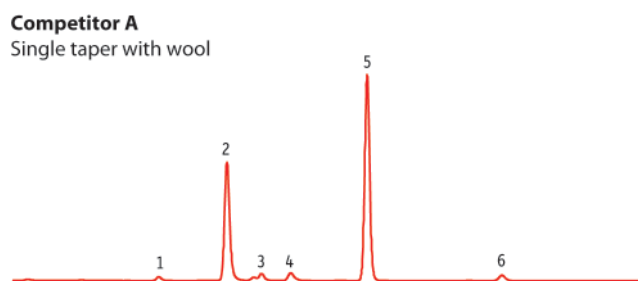
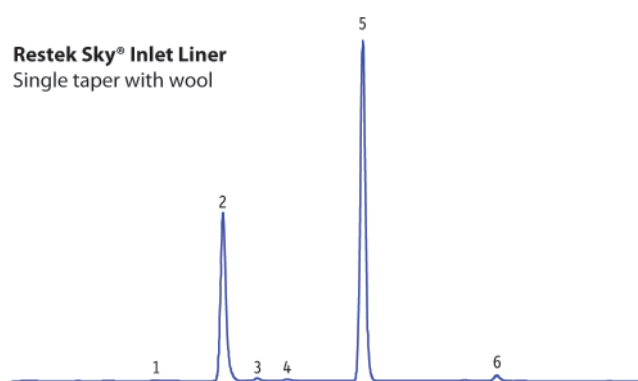
Many chromatographic problems, such as poor response and missing or tailing peaks, are caused by activity in the inlet liner. These effects complicate quantification and can be particularly problematic for sensitive analytes. Sky® inlet liners from Restek offer exceptional inertness, ensuring enhanced transfer of analytes to the column, good response, and highly symmetric peaks. The inertness of these liners is due to a state-of-the-art deactivation process that completely passivates the liner and wool so that they are inert to a wide variety of active analytes.

Some deactivations, such as base deactivation, are effective only for particular target compound chemistries. In contrast, the balanced deactivation of Sky® liners prevents interactions with many chemical classes. As shown on the following pages, complex pesticide probes, as well as both acidic and basic compounds have strong responses and excellent peak shapes, demonstrating the inertness of Sky® liners. With Sky® inlet liners, you will see improved sensitivity, accuracy, and reproducibility liner-to-liner, which allows you to quantify challenging compounds at trace levels with confidence.

Reduced Breakdown Improves Trace Analyses

Endrin and DDT are important analytes for the environmental and food safety industries, and they also serve as excellent general probes for liner inertness. Both compounds are sensitive to different modes of activity due to their chemical structures and their being analyzed at very low concentrations. As shown in Figure 1, Sky® liners are significantly more inert than comparable competitor liners, showing 3–4 times less endrin and DDT breakdown.

Figure 1: Endrin and DDT breakdown is significantly reduced with Sky® liners, demonstrating higher inertness.



Inert Sky® liners reduce analyte breakdown, giving you more accurate results.

	% Breakdown	
	Endrin	DDT
Restek	4.8	1.3
Competitor A	12	5.2

Peaks

1. DDE*
 2. Endrin
 3. DDD*
 4. Endrin aldehyde*
 5. DDT
 6. Endrin ketone*
- *breakdown products

GC_EV1200_1202

Column: Rxi®-5Sil MS, 15 m, 0.25 mm ID, 0.25 µm (cat.# 13620); **Sample:** Endrin (50 ng/mL) and DDT (100 ng/mL) in hexane; **Injection:** Inj. Vol.: 1 µL splitless (hold 0.75 min); **Liner:** Comparison of Sky® Single Taper Liner with Wool (cat.# 23303.5) and Agilent Single Taper Liner with Wool (cat.# 5062-3587); **Inj. Temp.:** 250 °C.; **Detector:** µ-ECD @ 300 °C.

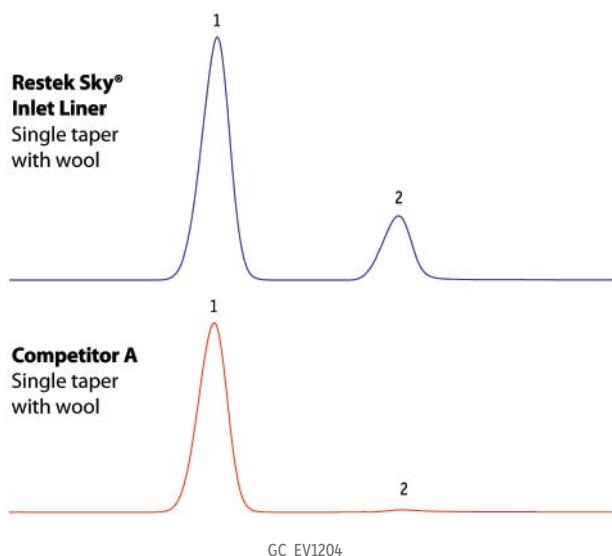
did you know?

Sky® inlet liners from Restek are extensively tested to ensure consistent product quality. The color and label have been shown not to interfere with analyses or contribute to background. Choose blue—the best liner for sensitive applications.

Greater Inertness Results in Higher Analyte Response

Another common probe used to illustrate inertness is 2,4-dinitrophenol (2,4-DNP), which functions as an indicator of acid compound interactions. It is used to monitor system suitability in semivolatiles methods, which benefit from the use of wool to assist in sample vaporization. As shown in Figure 2, the response of 2,4-DNP with the Sky® inlet liner, even at low concentrations, is superior to a competitor's liner. The competitor liner with wool has active sites that adsorb 2,4-DNP and reduce its response. In contrast, an excellent response is achieved using the Sky® liner, even in the presence of wool.

Figure 2: The state-of-the-art deactivation used for Sky® liners with wool results in higher responses for active acid compounds, such as 2,4-DNP.



Increase the response of active analytes with inert Sky® inlet liners!

	2,4-DNP Response Factor
Restek	0.28
Competitor A	0.02

Peaks

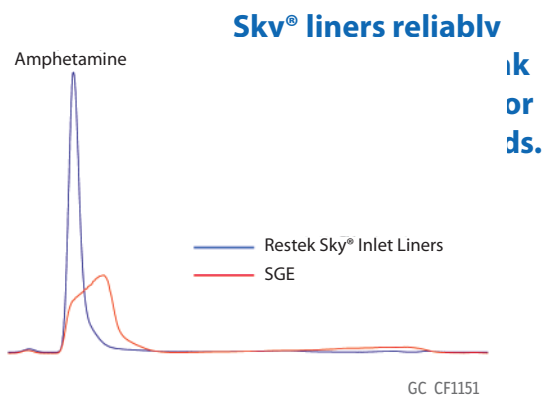
1. Acenaphthene (IS)
2. 2,4-DNP

Column: Rxi®-5Sil MS, 15 m, 0.25 mm ID, 0.25 µm (cat.# 13620);
Sample: 10 µg/mL each 2,4-dinitrophenol and acenaphthene standard in methylene chloride; **Injection:** Inj. Vol.: 1 µL splitless (hold 1 min); **Liner:** Comparison of Sky® Single Taper Inlet Liner with Wool (cat.# 23303.5) and Agilent Single Taper Inlet Liner with Wool (cat.# 5062-3587); **Inj. Temp.:** 250 °C; **Detector:** FID @ 300 °C.

Comprehensive Deactivation Ensures Excellent Peak Shape

In addition to providing excellent results for active pesticides and acidic compounds, Sky® inlet liners are also highly inert to active basic compounds, such as underivatized amphetamines. The exceptional inertness of Sky® liners produces much better peak shape than is typically seen on other liners, resulting in simpler quantification and more accurate results (Figure 3).

Figure 3: Sky® liners are completely passivated. Even when using wool, peak shape for highly active underivatized amphetamine is excellent.



Peaks

1. Amphetamine

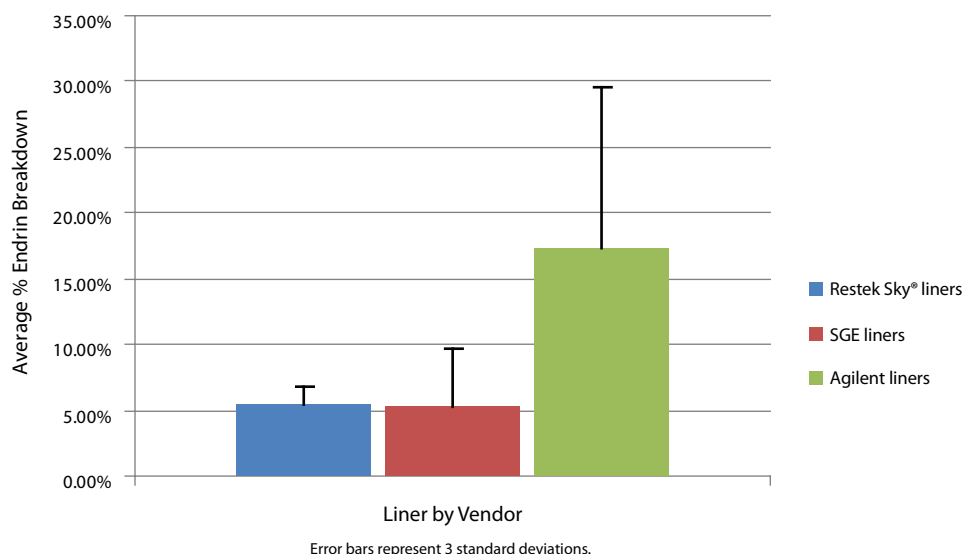
Column: Rxi®-5Sil MS, 30 m, 0.25 mm ID, 0.25 µm (cat.# 13623);
Sample: Amphetamine; Diluent: 1-chlorobutane; Conc.: ~10 µg/mL;
Injection: Inj. Vol.: 1 µL splitless (hold 1 min); **Liner:** Comparison of Sky® Single Taper with Wool (cat.# 23303.5) and SGE Single Taper with Wool (cat.# 092019); **Inj. Temp.:** 250 °C; **Purge Flow:** 20 mL/min; **Oven Temp:** 45 °C to 250 °C at 20 °C/min; **Carrier Gas:** He, constant flow; **Flow Rate:** 2 mL/min; **Detector:** FID @ 350 °C.; **Make-up Gas Flow Rate:** 45 mL/min; **Make-up Gas Type:** N₂; **Instrument:** Agilent 7890A GC

Liner-to-Liner Reproducibility: A Measure of Consistent Quality

It's not good enough to have one quality liner. You have to be confident that every liner will give the same level of performance. We test Sky® liners extensively to ensure that each one is exceptionally inert and will provide optimal results. Using endrin breakdown as a measure of reproducibility, the data in Figure 4, based on multiple lots, illustrate that Sky® liners are more consistently inert than competitor products.

Sky® liners provide exceptional inertness across a wide range of active analytes. The consistent, comprehensive deactivation process results in the accuracy and precision you need for reliable trace-level analyses. Simplify liner selection with Sky® liners from Restek—**choose blue, the best choice for dependable results.**

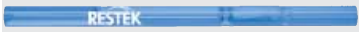
Figure 4: Sky® inlet liners from Restek consistently show less endrin breakdown than comparable liners from other sources.



Sky® inlet liners are easily recognizable for your reordering convenience. All Sky® liners come in specially marked boxes and are packaged in ultra-clean blister packs.

Sky® Inlet Liners for Shimadzu GCs

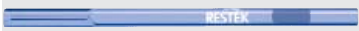
Split Liners for Shimadzu
17A, 2010, and 2014 GCs

	ID OD x Length	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
 Sky 3.5 mm Split	3.5 mm 5.0 mm x 95 mm	221-41444-01	23318.1	23318.5	23318.25
 Sky 3.5 mm Split w/Wool	3.5 mm 5.0 mm x 95 mm		23319.1	23319.5	23319.25
 Sky 3.5 mm Precision Liner w/Wool	3.5 mm 5.0 mm x 95 mm		23320.1	23320.5	
 Single Taper Precision Liner w/Wool	3.5 mm 5.0 mm x 95 mm		23455.1	23455.5	
 Cyclosplitter	3.5 mm 5.0 mm x 95 mm		23456.1	23456.5	

NEW!

NEW!

Splitless Liners for Shimadzu
17A, 2010, and 2014 GCs

	ID OD x Length	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
 Sky 3.5 mm Single Taper	3.5 mm 5.0 mm x 95 mm	221-48335-01	23321.1	23321.5	23321.25
 Sky 3.5 mm Single Taper w/Wool	3.5 mm 5.0 mm x 95 mm		23322.1	23322.5	
 Double Taper	3.5 mm 5.0 mm x 95 mm		23457.1	23457.5	

NEW!

Split/Splitless Liners for Shimadzu 17A, 2010, and
2014 GCs

	ID OD x Length	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
 Split/Splitless w/Wool	3.5 mm 5.0 mm x 95 mm	221-41444-00	23458.1	23458.5	23458.25

NEW!

Liners for Shimadzu 17A PTV GCs

	ID OD x Length	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
 PTV w/Wool	1.6 mm 4.0 mm x 95 mm	225-09212-01	23435.1	23435.5	23435.25

NEW!

DI Liners for Shimadzu 17A, 2010, and 2014 GCs

	ID OD x Length	ea.	cat.# 5-pk.
 Uniliner w/Wool	3.5 mm 5.0 mm x 95 mm	23459.1	23459.5

NEW!

Sky
Inlet Liners

Also Available for Agilent, PerkinElmer,
Thermo Scientific, and Bruker/Varian GCs



www.restek.com/sky

Patent pending



Siltek®-Deactivated
Inlet Liners

Intermediate Polarity (IP)–Deactivation

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

Siltek®-Deactivation

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

- Maximizes the inertness of the sample pathway with proprietary deactivation.
- Minimizes breakdown.
- Low bleed.
- Thermally stable.
- “Clean and green”—manufactured without the use of harmful organic solvents.
- Ideal for chlorinated pesticides.

The 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.

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

Base-Deactivation

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	addl. cost	-211.1	addl. cost	-229.1	addl. cost
5-pk.	-210.5	addl. cost	-211.5	addl. cost	-229.5	addl. cost
25-pk.	-210.25	addl. cost	-211.25	addl. cost	-229.25	addl. cost

Don't Forget Routine Maintenance

Inlet liners are the key to good injection port maintenance; changing them regularly helps prevent problems such as:

- 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.

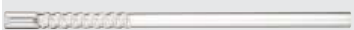
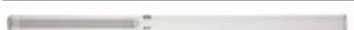
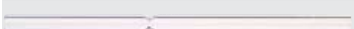
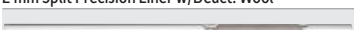
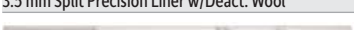
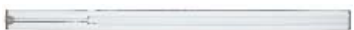
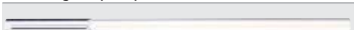
Finally, be sure to condition your liners at 20 °C higher than the operating inlet temperature for a minimum of 10 minutes to prepare them for use. By following these basic tips, you can avoid inlet problems and improve chromatographic performance.



Looking for the
Best Solution?

Sky® inlet liners, featuring a state-of-the-art deactivation, give you the inertness you need for accurate, reproducible trace-level results.

See pages 1–5 for details.

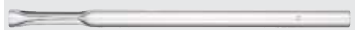
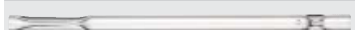
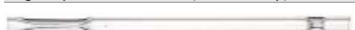
Split Liners for Shimadzu 14A GCs		Benefits/Uses:	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
	Split	universal, for most common analyses	3.5 mm 5.0 mm x 99 mm	221-32544-01	20860	20861	20862
		dirty samples, many injections before cleaning required	3.5 mm 5.0 mm x 99 mm		20870	20871	
	Cyclo splitter						
	Laminar Cup Splitter	high MW compounds	3.5 mm 5.0 mm x 99 mm		20868	20869	
Splitless Liners for Shimadzu 14A GCs		Benefits/Uses:	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
	3.5 mm Splitless	trace samples	3.5 mm 5.0 mm x 99 mm	221-32544-00	20863	20864	20865
Split Liners for Shimadzu 17A, 2010, and 2014 GCs		Benefits/Uses:	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
	1 mm Split	purge & trap, fast GC	1.0 mm 5.0 mm x 95 mm		20976	20977	20978
	3.5 mm Split	universal, for most common analyses	3.5 mm 5.0 mm x 95 mm	221-41444-01	22283	22284	22285
	2 mm Split Precision Liner w/Deact. Wool	dirty samples, trace samples	2.0 mm 5.0 mm x 95 mm		22171	22172	
	3.5 mm Split Precision Liner w/Deact. Wool	dirty samples, trace samples	3.5 mm 5.0 mm x 95 mm		21020	21021	
	3.5 mm Single Taper Precision Liner w/Deact. Wool	dirty samples, trace samples	3.5 mm 5.0 mm x 95 mm		22173	22174	
	Cyclo splitter	dirty samples, many injections before cleaning required	3.5 mm 5.0 mm x 95 mm		22072	22073	
Splitless Liners for Shimadzu 17A, 2010, and 2014 GCs		Benefits/Uses:	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.# 5-pk.	
	3 mm Single Taper Splitless	universal, trace samples	2.0 mm 5.0 mm x 95 mm		22276	22277	
	3.5 mm Single Taper Splitless	universal, trace samples	3.5 mm 5.0 mm x 95 mm	221-48335-01	22286	22287	
	Double Taper Splitless	reduces backflash and catalytic decomposition	3.5 mm 5.0 mm x 95 mm		22274	22275	
Split/Splitless Liners for Shimadzu 17A, 2010, and 2014 GCs		Benefits/Uses:	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
	Split/Splitless w/Deact. Wool	universal, for most common analyses	3.5 mm 5.0 mm x 95 mm	221-41444-00	20955	20956	20957

*Nominal ID at syringe needle expulsion point.

All liners are shipped with intermediate polarity (IP) deactivation unless otherwise requested.
See page 6.

SPME Liner for Shimadzu 17A, 2010, and 2014 GCs	Benefits/Uses	ID* OD x Length	ea.	cat.# 5-pk.
 SPME Liner	ideal for low volume SPME applications	0.75 mm 5.0 mm x 95 mm	22278	22279

Liners for Shimadzu 17A PTV GCs	Benefits/Uses	ID* OD x Length	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
 17A PTV Liner w/Deact. Wool	trace, dirty, high & low MW active samples	1.6 mm 4.0 mm x 95 mm	225-09212-01	21705	21706	21707

DI Liners for Shimadzu 17A, 2010, and 2014 GCs (0.25/0.32/0.53 mm ID)	Benefits/Uses	ID* OD x Length	ea.	cat.# 5-pk.
 Uniliner w/Deact. Wool	trace, dirty, high MW active samples, high recovery & linearity	3.5 mm 5.0 mm x 95 mm	21713	21719
 Open-Top Drilled Uniliner (hole near top)	trace, active samples, high recovery & linearity	3.5 mm 5.0 mm x 95 mm	21285	21286
 Open-Top Drilled Uniliner (hole near bottom)	trace, active samples, high recovery & linearity	3.5 mm 5.0 mm x 95 mm	21287	21288
 Single Taper Drilled Uniliner (hole near top)	trace, active samples, high recovery & linearity	3.5 mm 5.0 mm x 95 mm	21289	21290
 Single Taper Drilled Uniliner (hole near bottom)	trace, active samples, high recovery & linearity	3.5 mm 5.0 mm x 95 mm	21291	21292

*Nominal ID at syringe needle expulsion point.

All liners are shipped with intermediate polarity (IP) deactivation unless otherwise requested. See page 6.



tech tip

Drilled Uniliner® Liners

Use the Drilled Uniliner® liner with the hole near the bottom for semivolatile 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 analyses in which the compounds of interest elute away from the solvent peak.



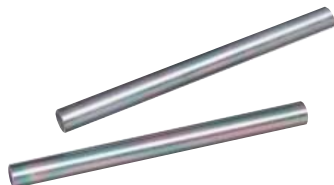
Restek can provide any of the liners shown deactivated by one of three processes, including highly inert Siltek® coating. Ordering information is on **page 6**.



Packing materials, including wool and CarboFrit® inserts, can be provided in any liner—subject to the liner ID and geometry. Ordering information is on **page 9**.



Siltek® Treated Liners



Siltek® Treated Metal Inlet Liners for Shimadzu GCs

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

Liner Type (3.5 mm ID x 5.0 mm OD x 95 mm)	qty.	cat.#
95 mm Split/Splitless w/Deact. Wool, Siltek, Metal	5-pk.	21003



24324

Deactivated Wool

- More inert than our traditional fused silica wool.
- Use to vaporize a sample in a liner prior to introduction into a capillary column.

Description	qty.	cat.#
Deactivated Wool	10 grams	24324



20999

Base-Deactivated Wool

Ideal for amines and other basic compounds.

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

Packed Inlet Liners

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

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

†CarboFrit® inserts require a neck greater than 2 mm.

CarboFrit® Inlet Liner Packing Material

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



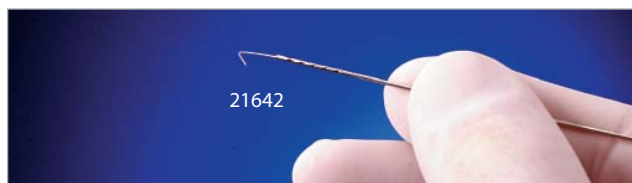
Add the corresponding suffix number to the liner catalog number.

qty.	suffix	
ea.	-209.1	addl. cost
5-pk.	-209.5	addl. cost
25-pk.	-209.25	addl. cost

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

Replacement CarboFrit® Inserts

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

**CarboFrit® Puller/Insertor Tool**

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

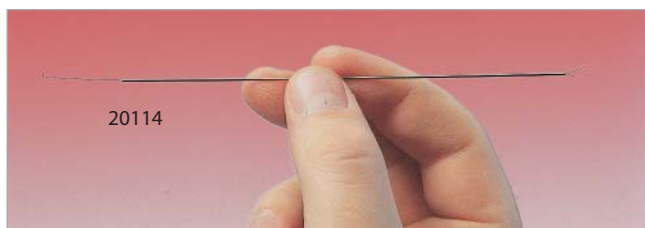
Description	qty.	cat.#
CarboFrit Puller/Insertor Tool	ea.	21642



tech
tip

Use of Packings With an 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.#
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 manufacturers' liners.



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



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



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

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

Recommended for inlet liners with an ID $\geq$ 2 mm.



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



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
WISP 48 Snap Seal Vial	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.

Viton® O-Rings for Shimadzu 17A, 2010, and 2014 GCs

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

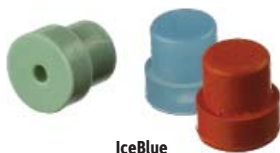
**Graphite O-Rings**

for Shimadzu 2010 and 2014 GCs

Description	Max. temp.	Similar to Shimadzu part #	qty.	cat. #
Graphite O-Rings for Split Liners	450 °C	221-48393-91	5-pk.	20243
Graphite O-Rings for Splitless Liners	450 °C	221-47222-91	5-pk.	20244

**Septa (Plug)** for Shimadzu GCs

Thermolite Septa		IceBlue Septa		Premium Non-stick BTO Septa*	
usable to 340 °C inlet temp.		usable to 250 °C inlet temp.		usable to 400 °C inlet temp.	
qty.	cat. #	qty.	cat. #	qty.	cat. #
25-pk.	27153	50-pk.	27170	50-pk.	27098
50-pk.	27154	100-pk.	27171	100-pk.	27099
100-pk.	27155				



*Minimum recommended operating temperature for Premium Non-Stick BTO septa is 250 °C.

Note: Due to differences in inlet design, the actual septum temperature for a given inlet setpoint can vary by manufacturer.

Merlin Microseal Septa for Shimadzu GCs

- Compatible with Shimadzu models GC-2010 and GC-2025 only.
- 450 °C maximum injection port temperature.
- For use with 23-gauge (0.63 mm, 0.025") needle or probe with blunt, truncated conical tip.



A Merlin Microseal septum provides several distinct advantages: elimination of septum coring, long lifetime, and consistently low needle-insertion force. The Microseal septum incorporates two separate sealing mechanisms; these sliding seals prevent septum coring and the associated accumulation of septum crumbs in the injection port liner. Installation is simple, requiring no modification of the injection port.

Description	Merlin #	cat. #
General Purpose Kit for Shimadzu GCs (3 to 100 psi) Includes: Nut, Adapter, O-Ring, & 2 General-Purpose (#410) Microseals	61-12	22972
Replacement Microseals		
General Purpose Microseal (most applications, 3 to 100 psi)	410	22812
Low-Pressure Microseal (1 to 45 psi)	310	22815
Microseal for SPME Applications (3 to 100 psi)	21-01	22782

Septum Nut for Shimadzu 17A, 2010, and 2014 GCs

- One-piece design for ease of installation and removal.
- Made of clear anodized aluminum and high-quality stainless steel.



Description	Similar to Shimadzu part #	qty.	cat. #
Septum Nut for Shimadzu 17A, 2010, and 2014 GCs	221-41286-00, 221-44584-00	ea.	22079

Injector Nut Kit for Shimadzu 17A, 2010, and 2014 GCs

Includes 17A injector nut, 0.4 mm graphite ferrule, and 1/16-inch stainless steel capillary nut.



Description	qty.	cat. #
Injector Nut Kit for Shimadzu 17A, 2010, and 2014 GCs	kit	21895
Siltek Treated Injector Nut Kit for Shimadzu 17A, 2010, and 2014 GCs	kit	22331

Capillary Nut for Shimadzu 17A, 2010, and 2014 GCs
Meets original manufacturer's performance.

Description	Similar to Shimadzu part #	qty.	cat. #
Capillary Nut for Shimadzu 17A, 2010, and 2014 GCs	221-41533-00	2-pk.	22688

Restek Enhanced Capillary Nut for Shimadzu 17A, 2010, and 2014 GCs

- Restek's design eliminates the slot, increasing lifetime and durability.
- Meets or exceeds original manufacturer's performance.



Description	Similar to Shimadzu part #	qty.	cat. #
Restek Enhanced Capillary Nut for Shimadzu 17A, 2010, and 2014 GCs	221-41533-00	2-pk.	20375

5 mm Ferrules for Shimadzu 17A GCs

- For use with packed columns.
- Graphite construction.



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

Graphite Ferrules for Shimadzu 17A, 2010, and 2014 GCs

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



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



22839



restek recommends

When your Leak Detector batteries need to be replaced, send the unit to us for a routine maintenance review to ensure continued sensitivity and reliability. We will replace not only the batteries, but also the probe and internal/external tubing. We will also recertify your unit. Contact Customer Service to send in your Leak Detector for maintenance (cat. #22839-R).



Carrying/storage case included with purchase of unit.



22658

Verify hard-to-reach leaks using the small probe adaptor (sold separately).

Restek Electronic Leak Detector

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

Features & benefits include:

- Optimized sample flow path.
- Ergonomic, handheld design.
- Rugged side grips for added durability.
- Handy probe storage for cleanliness and convenience.
- Long-lasting battery; up to 6 hours of continuous use.
- Automatic shutoff.
- A convenient carrying and storage case.
- Easy-to-clean probe assembly.
- A universal charger set (U.S., European, UK, and Australian plugs included).

Backed by a 1-year warranty, the Restek Leak Detector is the industry standard for performance and affordability in handheld leak detectors.

Leak Detector Facts

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

Limits of Detection

These gases can be detected with the Restek Electronic Leak Detector at the following leak rates:

Minimum Detectable Gas Limits and Indicating LED Color:

- Helium, 1.0×10^{-5} , red LED
- Hydrogen*, 1.0×10^{-5} , red LED
- Nitrogen, 1.4×10^{-3} , yellow LED
- Argon, 1.0×10^{-4} , yellow LED
- Carbon Dioxide, 1.0×10^{-4} , yellow LED

Gas detection limits measured in atm cc/sec

Description	qty.	cat.#
Leak Detector With Hard-Sided Carrying Case and Universal Charger Set (U.S., UK, European, Australian)	ea.	22839
Leak Detector Routine Maintenance Review	ea.	22839-R
Soft-Side Storage Case	ea.	22657
Small Probe Adaptor	ea.	22658

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

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



Checking for leaks maintains the integrity of a GC system.

Restek ProFLOW 6000 Electronic Flowmeter

State-of-the-art features include:

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

Flowmeters that can measure flammable gases are becoming mandatory, due to the increased use of hydrogen in chromatography. With its Ex rating, the Restek ProFLOW 6000 Flowmeter is designed specifically with explosive and flammable gases in mind.

The Restek ProFLOW 6000 is the only flowmeter you need for any type of chromatography gas measurement because of its wide range of capabilities. The ProFLOW 6000 is an electronic device capable of measuring volumetric flow for most gases. Real-time measurements can be made for various types of flow paths, including continually changing gas types. This portable unit is designed for easy handheld use, and the stand adds benchtop convenience.

Flowmeter Facts:

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

Description

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

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



restek recommends

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



did you know?

All Restek Super-Clean gas filter cartridges (except hydrocarbon filter cat.# 22030) feature easy-to-read indicators. The indicator code is shown on every trap, so there is no confusion about when to replace it.

Restek Super-Clean Gas Filters

- High-purity output ensures 99.9999% pure gas (at max. flow of 2 L/min).
- “Quick connect” fittings for easy, leak-tight cartridge changes.
- Glass inside to prevent diffusion; polycarbonate housing outside for safety.
- All traps measure 10 ⁵/₈" x 1 ³/₄" (27 x 4.4 cm).
- Each base plate unit measures 4" x 4" x 1 ⁷/₈" (10.2 x 10.2 x 4.8 cm).

Table I: Each Super-Clean gas filter provides high-purity outlet gas.

Type of Filter	Outlet Gas Quality (%)	Maximum Pressure/ Maximum Flow Rates	Use for:	Indicator Color Change	Capacity			Estimated Lifetime (years)
					H ₂ O (g)	O ₂ (mL)	Hydrocarbons (g)	
Moisture cat.# 22028	>99.9999	11 bar 159 psi/ 7 L/min	Inert carrier gas Air Hydrogen	Yellow/orange to clear	7.2	—	—	>2
Oxygen cat.# 22029	>99.9999	11 bar 159 psi/ 7 L/min	Inert carrier gas	Green to grey	NA	1,000	—	>2
Hydrocarbons cat.# 22030	>99.9999	11 bar 159 psi/ 7 L/min	Inert carrier gas Air Hydrogen	No indicator	NA	—	12 ¹	>2
Fuel Gas ¹ cat.# 22022	>99.9999	11 bar 159 psi/ 7 L/min	Inert carrier gas Air Hydrogen	Yellow/orange to clear	3.5	—	24 ¹	>1.5
Triple ² cat.# 22020	>99.9999	11 bar 159 psi/ 7 L/min	Inert carrier gas	Yellow/orange to clear Green to grey	1.8	500	4 ³	>1
Helium Specific ² cat.# 21982	>99.9999	11 bar 159 psi/ 7 L/min	Helium	Yellow/orange to clear Green to grey	1.8	500	—	>1

¹Removes hydrocarbons and moisture.

²Removes hydrocarbons, moisture, and oxygen.

³As *n*-butane.



22020



21982



base plate

Restek Super-Clean Gas Filter Kits and Replacements

Description	qty.	cat.#
Carrier Gas Cleaning Kit	kit	22019
Includes: mounting base plate, ¹ / ₈ " inlet/outlet fittings, and oxygen/moisture/hydrocarbon triple gas filter		
Fuel Gas Purification Kit	kit	22021
Includes: mounting base plate, ¹ / ₈ " inlet/outlet fittings, and hydrocarbon/moisture fuel gas filter		
Ultra-High Capacity Hydrocarbon Filter	ea.	22030
Ultra-High Capacity Moisture Filter	ea.	22028
Ultra-High Capacity Oxygen Filter	ea.	22029
Replacement Triple Gas Filter (removes oxygen, moisture, and hydrocarbons)	ea.	22020
Replacement Fuel Gas Filter (removes moisture and hydrocarbons)	ea.	22022
Helium-Specific Carrier Gas Cleaning Kit	kit	21983
Includes: mounting base plate, ¹ / ₈ " inlet/outlet fittings, and oxygen/moisture/hydrocarbon helium-specific filter		
Replacement Helium-Specific Gas Filter (removes oxygen, moisture, and hydrocarbons)	ea.	21982
Gas Filter Bundle Kit	kit	22031
Includes: one triple gas filter (cat.# 22020) and two fuel gas filters (cat.# 22022)		



Oxygen and Moisture Traps

Restek highly recommends oxygen and moisture traps for make-up gas when operating sensitive detectors such as electron capture detectors (ECD). The hydrogen reaction gas for sensitive electrolytic conductivity detectors (ELCD) also requires a hydrocarbon trap to remove trace impurities.

Scoring Wafer with Handle

- Ceramic wafer is straight-edged for cutting fused silica tubing cleanly.
- Unique, ergonomic handle is made of soft, comfortable rubber.



23015



Hold tubing firmly in one hand, allowing about two inches to extend freely. Hold the scoring wafer at a 45° angle to the tubing. Exert just enough pressure to put a slight arc in the tubing. Pull perpendicularly across the tubing.



The tubing should fall off on its own, or it should easily break at the score with a slight tap of the wafer.



Check the cut against the white of the scoring wafer. Look for a clean, square cut.

Description	qty.	cat.#
Scoring Wafer with Handle	2-pk.	23015

Ceramic Scoring Wafer

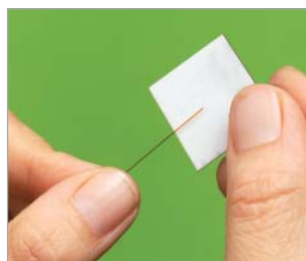
- Four straight scoring edges for cutting fused silica tubing and four serrated edges for cutting MXT® metal capillary columns.



20116



Exert just enough pressure to put a slight arc in the tubing. Pull perpendicularly across the tubing. The tubing should fall off or break with a slight tap of the wafer.



Check the cut against the white of the scoring wafer. Look for a clean, square cut.

Description	qty.	cat.#
Ceramic Scoring Wafers	5-pk.	20116

Septum Puller

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



Remove a septum without damaging an expensive weldment.



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



20117

Description	qty.	cat.#
Septum Puller	ea.	20117



save money!

Save money on column installation tools by purchasing the MLE Capillary Tool Kit. See page 16.



27194

GC-MS Cleaning Kit

The Restek GC-MS Cleaning Kit (cat. #s 27194, 27195) includes:

- lint-free nylon gloves (small-2 pair)
- lint-free nylon gloves (large-2 pair)
- lint-free cotton cloth, 9 x 9 (10-pk.)
- micro mesh 4 x 6 sheet (4-pk.)
- aluminum oxide (1-kg jar)
- cotton tip applicators
- tweezers, large
- tweezers, small
- septum puller
- Dremel® tool, battery-operated (optional, 27194)
- tool kit bag

Reorder Kit (cat. # 27196) includes:

- lint-free nylon gloves (small-2 pair)
- lint-free nylon gloves (large-2 pair)
- lint-free cotton cloth, 9 x 9 (10-pk.)
- micro mesh 4 x 6 sheet (4-pk.)

Poor sensitivity, loss of sensitivity at high masses, or high multiplier gain during an auto tune are all indicators that your mass spectrometer source may need to be cleaned. Restek has assembled all of the necessary components for cleaning and polishing your ion source.

Description	qty.	cat.#
Mass Spec Cleaning Kit with Dremel Tool	kit	27194
Mass Spec Cleaning Kit without Dremel Tool	kit	27195
Mass Spec Cleaning Kit Replacement Parts Kit Includes: cloths, micro mesh sheets, small and large gloves	kit	27196



21159

Injector Wrench for Shimadzu 17A, 2010, and 2014 GCs

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

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



22333

Capillary Installation Gauge for Shimadzu 17A, 2010, and 2014 GCs

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

Description	qty.	cat.#
Capillary Installation Gauge for Shimadzu 17A, 2010, and 2014 GCs	ea.	22333

*For use with graphite ferrules only.



22334

Open-End Wrench Set for use with Shimadzu 17A, 2010, and 2014 Capillary Installation Gauge

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



22182

Everything you need
in one complete kit!

Make Life Easier (MLE) Capillary Tool Kit for Shimadzu GCs**Includes:**

- capillary installation gauge for Shimadzu GCs
- injector 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 (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
- rubber-tipped slide-lock tweezers
- scoring wafers
- inlet liner removal tool
- septum puller
- mini wool puller/insert tool
- 4-inch tapered needle file
- swivel head flashlight
- mini hand drill set
- 15 cm compact steel ruler
- pocket magnifier
- high-temperature string (1 meter)
- pipe cleaner (12 inch)
- cotton tip swabs (pk. of 25)

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

also **available****Shimadzu FID Jets**

Please contact Customer Service or your Restek representative for details.

Vespel® Ferrules

- 100% high-temperature polyimide.
- Stable to 350 °C.
- Durable, leak-tight.



Vespel® ferrules

Graphite Ferrules

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

Vespel®/Graphite Ferrules

- 60%/40% Vespel®/graphite blend offers the best combination of sealing and ease of workability.
- Seal with minimal torque, reusable, and preferred for vacuum and high-pressure uses.
- Stable to 400 °C.
- Recommended for mass spec transfer lines.

Capillary Ferrules for 1/16-Inch Compression-Type Fittings

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

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

*For micropacked columns.

**For 0.28 mm MXT columns.

Encapsulated Ferrules for 1/16-Inch Compression Fittings

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

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

Standard Ferrules for 1/16-, 1/8-, and 1/4-Inch Fittings

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

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

**Choosing the Right Ferrule**

Graphite ferrules are soft, easy to seal, stable to 450 °C, and contain no binders that might off-gas. Vespel®/graphite ferrules work better for vacuum and high-pressure applications (e.g., GC-MS) because they will not fragment or allow oxygen to permeate into the system, whereas graphite ferrules will. Because Vespel® and graphite ferrules are made from a harder material, they might require retightening after several temperature cycles. Alumaseal® ferrules are ideal for GC-MS. They will not crack or fragment and require no retightening after temperature cycles.



graphite ferrules



graphite ferrules



graphite ferrules



Two-Hole Ferrules for 1/8-Inch and 1/16-Inch Compression-Type Fittings

Fitting Size	Ferrule ID	Fits Column ID	qty.	Vespel/Graphite
1/16"	0.4 mm	0.25/0.28 mm	5-pk.	24848
1/16"	0.5 mm	0.32 mm	5-pk.	24849
1/8"	0.8 mm	0.45/0.53 mm	5-pk.	20246



Reducing Ferrules

Available in graphite or Vespel®/graphite material.

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



Blank Ferrules for 1/16-Inch Fittings

Fitting Size	Ferrule ID	qty.	Vespel/Graphite
1/16"	no hole	10-pk.	20240



Alumaseal® Ferrules

- Aluminum construction—will not crack or fragment.
- No retightening required after temperature cycles—excellent for GC-MS.
- Eliminate out-gassing and make leak-tight seals for less detector noise.
- Unique two-piece design permanently locks on fused silica tubing without causing breakage.
- Will not stick in fittings, unlike Vespel® or graphite ferrules.
- Stable to 550 °C.
- Use with any 1/16" compression-type fitting.

Ferrule ID	Fits Column ID	qty.	cat. #
0.4 mm	0.25 mm	10-pk.	21472
0.5 mm	0.32 mm	10-pk.	21473
0.8 mm	0.53 mm	10-pk.	21474



PTFE Ferrules

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

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

**5 mm Ferrules** for Shimadzu 17A GCs

- For use with packed columns.
- Graphite construction.

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

**Graphite Ferrules** for Shimadzu 17A, 2010, and 2014 GCs

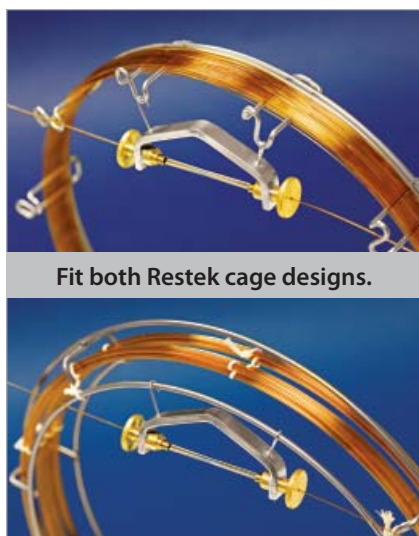
- Graphite 2-piece construction.
- Available in 0.4, 0.5, and 0.8 mm sizes.
- Packaged on mandrel for easy handling.

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

also **available**

Restek now carries Swagelok® fittings in brass & stainless steel.
See pages 32–33.

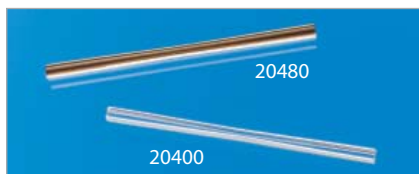




Fit both Restek cage designs.

Secure, reliable
column-to-column
connections!

NOTE: This product is not recommended for GC column-to-MS connections—use the Vacuum Vu-Union® union for this type of connection.

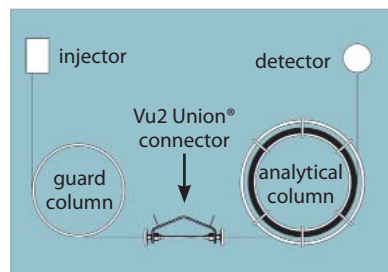


Vu2 Union® Connectors

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

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

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

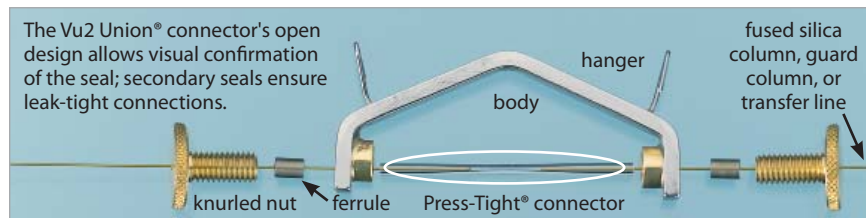


How does a Vu2 Union® connector work?

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

Who will benefit from using Vu2 Union® connectors?

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



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

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

Universal Press-Tight® Connectors

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

Graphite Ferrules for Vu2 Union® Connectors

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

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

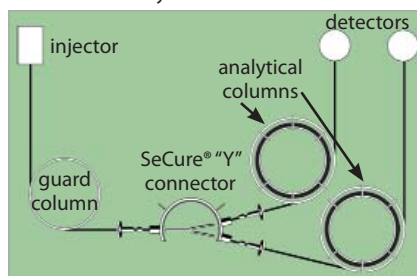
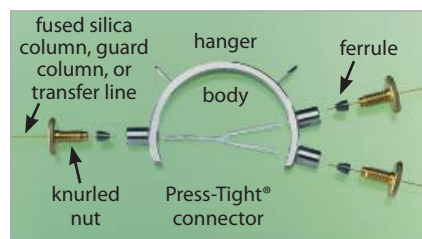
SeCure® “Y” Connector Kits

- Connect two analytical columns to a transfer line or guard column.
- Use standard “Y” Press-Tight® connectors and 1/16" graphite ferrules.
- Reliable seal integrity—will not unexpectedly disconnect during temperature-programmed analyses.
- Open design allows visual confirmation of the seal for added confidence in the connection.
- Fit both Restek cage designs.

Combine the simplicity of a “Y” Press-Tight® connector with the strength of a metal union. The ferrules and knurled nuts hold the fused silica tubing in place, which prevents the tubing from unexpectedly disconnecting, even at temperatures as high as 400 °C.

The SeCure® “Y” connector's open design allows visual confirmation of the seal.

Dual-column confirmational analysis with a single injection—one of the SeCure® “Y” connector's many uses.



Fit both Restek cage designs.



**Secure, reliable
column-to-column
connections!**

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

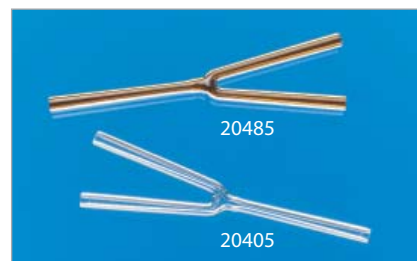
Description	Ferrules Fit Column ID	qty.	cat.#
SeCure “Y” Connector Kit	0.18/0.25/0.28 mm	kit	20276
SeCure “Y” Connector Kit	0.32 mm	kit	20277
SeCure “Y” Connector Kit	0.45/0.53 mm	kit	20278
Knurled nut		3-pk.	20279

Universal “Y” Press-Tight® Connectors

An alternative method of performing dual-column confirmational analyses!

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

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



Graphite Ferrules for SeCure® “Y” Connectors

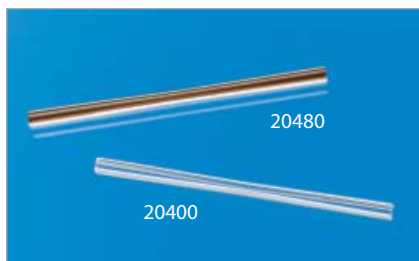
- Preconditioned to minimize out-gassing.
- High-purity, high-density graphite.
- Stable to 450 °C.
- No binders that can off-gas or adsorb analytes.
- Smooth surface and clean edges.

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



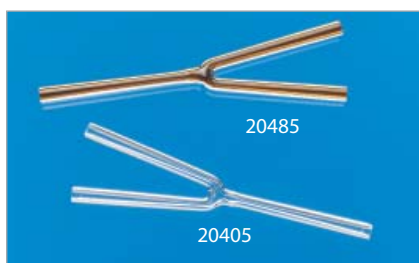
Press-Tight® Connectors

- Deactivated Press-Tight® connectors maintain complete inertness for the GC flow path.
- Siltek®-deactivated connectors are ideal for organochlorine pesticides analysis.
- Fit 0.33–0.74 mm OD columns (Restek 0.1–0.53 mm ID).

**Universal Press-Tight® Connectors**

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

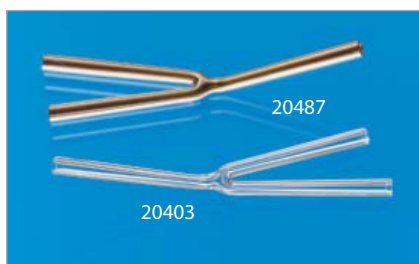
Description	5-pk.	25-pk.	100-pk.
Universal Press-Tight Connectors	20400	20401	20402
Universal Press-Tight Connectors, Deactivated	20429	20430	
Universal Press-Tight Connectors, Siltek Deactivated	20480	20449	

**Universal “Y” Press-Tight® Connectors**

An alternative method of performing dual-column confirmational analyses!

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

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

**Universal Angled “Y” Press-Tight® Connectors**

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

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

**Polyimide Resin**

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

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

MXT®-Union Connector Kits for Fused Silica Columns

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

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



MXT®-Union Connector Kits for Fused Silica Columns

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

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

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

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



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

1/32-Inch Replacement Nut

Description	qty.	cat.#
1/32" Replacement Nut	5-pk.	20389



Valco® Connectors—One-Piece Valcon Polyimide Adaptor Ferrule for Fused Silica

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

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

Tubing OD	Tubing ID	Valco #	qty.	cat.#
0.25–0.40 mm	0.25 mm	FS.4-5	5-pk.	20137
0.40–0.50 mm	0.32 mm	FS.5-5	5-pk.	20140
0.50–0.80 mm	0.53 mm	ZF.5V-5	5-pk.	20141
1/32" Replacement Nut			5-pk.	20389



Ferrule Removal Kit

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

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

NEW!


22358

CE

Universal plug set for
battery charger included
in all kits.

Electronic Rechargeable Crimpers and Decappers

- Easy to use; comfortable grip.
- Hundreds of operations from one charge.
- Adjustable crimping force.
- Large battery allows for faster charge cycle.
- All kits include a universal plug set for the battery charger.
- For 11 mm and 20 mm caps.
- One-year warranty.

These electronic crimpers and decappers have a rechargeable 6.4-volt battery installed. The large battery allows for quick, powerful operation and a faster charge cycle, minimizing downtime. Charging the battery takes thirty minutes to two hours. The universal plug set includes U.S., European, UK, and Australian plug clips.

Description	Size	qty.	cat.#
Electronic Crimper	11 mm	kit	22358
Electronic Crimper	20 mm	kit	22359
Electronic Decapper	11 mm	kit	22360
Electronic Decapper	20 mm	kit	22361
Replacement Battery for Electronic Crimpers and Decappers		ea.	22362

NEW!


Crimper

Decapper

Easy Grip Manual Crimpers and Decappers

Our new Easy Grip Crimpers and Decappers feature tough, light, glass-filled plastic bodies with curved handles that improve hand comfort during use. The bottom-pull handle allows for a steadier hold than top-push handles. An easily viewed adjustment knob is located at the head of the product. The clearly shown + and – symbols, along with directional arrows, simplify adjusting the intensity of the crimp/decap needed. The knob is also designed to indicate when the crimp setting has been reached, when it fully contacts the body of the product.

Description	Size	qty.	cat.#
Crimper	11 mm	ea.	23396
Crimper	20 mm	ea.	23398
Decapper	11 mm	ea.	23397
Decapper	20 mm	ea.	23399

Safer than removing
caps with pliers, knives,
or screwdriver blades!

2.0 mL Crimp-Top Vials, 12 x 32 mm, 11 mm

Choose with or without white graduated marking spots.

Description	Color	Material	100-pk.	1,000-pk.
Vial w/White Graduated Marking Spot	Clear	Glass	24383	24384
Vial w/White Graduated Marking Spot	Amber	Glass	24385	24386
Vial without Graduated Marking Spot	Clear	Glass	21152	21153



24385



24383

2.0 mL, 11 mm Aluminum Crimp Seals With Septa

Seal Color	Septa Material	100-pk.	500-pk.	1,000-pk.
Silver	PTFE/Natural Rubber	21174	—	21175
Blue	PTFE/Red Rubber	24351	—	24352
Green	PTFE/Red Rubber	24353	—	24354
Red	PTFE/Red Rubber	24355	—	24356
Yellow	PTFE/Red Rubber	24357	—	24358
Mixed	PTFE/Rubber	—	21724	—
Silver	PTFE/Silicone	24359	—	24360
Blue	PTFE/Silicone	24361	—	24362
Green	PTFE/Silicone	24363	—	24364
Red	PTFE/Silicone	24365	—	24366
Yellow	PTFE/Silicone	24367	—	24368
Mixed	PTFE/Silicone	—	21725	—
Silver	PTFE/Silicone/PTFE	24369	—	24370



21724

2.0 mL, 11 mm crimp-top vials are compatible with Shimadzu SIL-10A, 10Ai, 10AxI, and AOC 20i instruments.

2.0 mL Crimp Vial Convenience Kits (Vials, Caps & Septa)

Vials packaged in a clear-lid tray. Caps with septa packaged in a plastic bag.

Description	100-pk.	1,000-pk.
Clear 2.0 mL Vial, Deactivated, Silver Seal, PTFE/Natural Rubber Septa	24671	24672
Amber 2.0 mL Vial, Deactivated, Silver Seal, PTFE/Natural Rubber Septa	24673	24674
Clear 2.0 mL Vial, Untreated, Silver Seal, PTFE/Natural Rubber Septa	21196	21197
Amber 2.0 mL Vial, Untreated, Silver Seal, PTFE/Natural Rubber Septa	21198	21199
Clear 2.0 mL Vial, Untreated, Silver Seal, PTFE/Silicone Septa	24646	24647
Amber 2.0 mL Vial, Untreated, Silver Seal, PTFE/Silicone Septa	24648	24649



24671

Inserts for 2.0 mL, 11 mm Crimp-Top & 2.0 mL, 9 mm Short-Cap, Screw-Thread Vials

Description	Volume	Material	100-pk.	1,000-pk.
Big Mouth Insert w/Bottom Spring	50 µL	Glass	24513	21782
Big Mouth Insert w/Bottom Spring	250 µL	Glass	21776	21777
Big Mouth Insert w/Glass Flange (Step Design)*	250 µL	Glass	24516	21779
Insert, Flat Bottom	350 µL	Glass	21780	24517
Insert, Flat Bottom w/ID Ring	350 µL	Glass	24692	24693
Big Mouth Insert w/Bottom Spring	250 µL	Polypropylene	24518	—
Big Mouth Insert w/Bottom Spring & Graduated Markings	250 µL	Polypropylene	24518A	—
Big Mouth Insert, Top Flange	250 µL	Polypropylene	24519	—
Big Mouth Insert, No Spring	250 µL	Polypropylene	24520	—

*Big Mouth insert w/glass flange (step design) not to be used with 9 mm screw-thread vials.



21776



24692



24518A

2.0 mL Crimp-Top Vial With 100 µL Insert

- Plastic vial.
- Choice of glass or polypropylene insert.

Description	100-pk.	1,000-pk.
Clear Plastic Vial w/100 µL Polypropylene Insert	24651	24652
Clear Plastic Vial w/100 µL Glass Insert	24653	—



24651



2.0 mL, 11 mm Poly Crimp Seal Caps: Snap-On or Crimp

The Poly Crimp seal is versatile, working as either a snap-on or crimp-top cap. Simply use a standard crimping tool to secure the Poly Crimp seal onto any crimp-top vial. It's that easy!



Seal Color	Liner Material	100-pk.	400-pk.	1,000-pk.
Clear	PTFE/Butyl Rubber	24433	—	24434
Clear	PTFE/Silicone	24443	—	24444
Blue	PTFE/Silicone	24445	—	24446
Clear	PTFE/Silicone/PTFE	24453	—	24454
Blue	PTFE/Silicone/PTFE	24455	—	24456
Mixed	PTFE/Silicone/PTFE	—	21728	—

*Based on continual use for 3–4 days.



21731

2.0 mL, 11 mm GC Snap Ring Cap With Septum

- Snaps on any crimp-style vial.
- Save money! Use this snap cap when you don't need to crimp.

Description	Liner/Septa Material	100-pk.	1,000-pk.
Polypropylene Snap Ring Cap w/Liner	PTFE, 10 mil	21729	21730
Polypropylene Snap Ring Cap w/Septum	PTFE/Butyl Rubber	21731	21732
Polypropylene Snap Ring Cap w/Septum	PTFE/Silicone	21733	21734



22788

Certified Autosampler Vial Kits

Certified Vials, 2.0 mL Screw-Thread Vials

- Certificates enclosed with each kit.
- Vials of clear or amber borosilicate glass with ID marking spots.
- Closures with pre-inserted septa.
- Each kit sealed for integrity.

Certification Parameters Include:

Vial Dimensions:	height, diameter, bottom thickness, neck length, thread profile, and annealing
Cap/Septum:	diameter, height, thread integrity, center flash, septa insertion, sealing/resealing test, residue by headspace GC, and extractables
Chemical Test:	HPLC Test: nonvolatile residue GC Test: volatile residue



22792

Description	100-pk.
Assembled Clear 2.0 mL Vial w/Marking Spot, Cap, Bonded PTFE/Silicone Slit Septa	22789
Assembled Amber 2.0 mL Vial w/Marking Spot, Cap, Bonded PTFE/Silicone Slit Septa	22788
Unassembled Clear 2.0 mL Vial w/Marking Spot, Cap, Bonded PTFE/Silicone Septa	22792
Unassembled Amber 2.0 mL Vial w/Marking Spot, Cap, Bonded PTFE/Silicone Septa	22790
Unassembled Clear 2.0 mL High-Recovery Vial w/Marking Spot, Cap, Bonded PTFE/Silicone Slit Septa	22793
Unassembled Amber 2.0 mL Vial w/Marking Spot, Cap, Bonded PTFE/Silicone Slit Septa	22791

2.0 mL, 9 mm Short-Cap, Screw-Thread Vials, 12 x 32 mm

- Fit all 2.0 mL, 12 x 32 mm, crimp-top vial-based autosamplers.

2.0 mL, 9 mm Short-Cap, Screw-Thread Vials (vial only)

Description	Color	100-pk.	1,000-pk.
Short-Cap Vial w/White Graduated Marking Spot	Clear	21140	21141
Short-Cap Vial w/White Graduated Marking Spot	Amber	21142	21143
Short-Cap Vial without Graduated Marking Spot	Clear	21154	21155



21140

2.0 mL, 9 mm Short-Cap, Screw-Vial Closures (Polypropylene, preassembled)

Cap Color	Liner Material	100-pk.	500-pk.	1,000-pk.
Blue	PTFE/Red Rubber	24473	—	24474
Mixed	PTFE/Red Rubber	—	24668	—
Blue	PTFE/Silicone	24485	—	24486
Green	PTFE/Silicone	24487	—	24488
Yellow	PTFE/Silicone	24493	—	24494
Mixed	PTFE/Silicone	—	24669	—
Blue	PTFE/Silicone/PTFE	24497	—	24498
Black	PTFE/Silicone/PTFE	24495	—	24496
Natural	PTFE/Silicone/PTFE	24501	—	24502
Red	PTFE/Silicone/PTFE	24503	—	24504
Yellow	PTFE/Silicone/PTFE	24505	—	24506
Mixed	PTFE/Silicone/PTFE	—	24670	—



24668

2.0 mL, 9 mm short-cap, screw-thread vials are compatible with Shimadzu SIL-10A, 10Ai, and 10Axi instruments.

2.0 mL Sample Vial Racks

- Racks feature alphanumeric indexing for easier vial identification.
- Racks can be stacked for efficient storage.
- Fits most 2.0 mL, 12 x 32 mm vials (vials sold separately).

Description	Capacity	qty.	cat.#	qty.	cat.#
Polypropylene Storage Rack for 12 x 32 mm Vials	50 vials, 5 x 10	ea.	22856	5-pk.	22857



22856



All vials undeactivated unless otherwise noted.

2.0 mL, 8 mm screw-thread vials are compatible with Shimadzu AOC-8B/9, SIL-6A, AOC14/1400, AOC-17, SIL-6B, -9A, -8A, SIL-10A, 10Ai, and 10Axi instruments.

2.0 mL Screw-Thread Vials, 12 x 32 mm, 8 mm/425 Thread

- Fit all 2.0 mL, 12 x 32 mm, screw-thread 8 mm/425 vial-based autosamplers.

2.0 mL, 8 mm Screw-Thread Vials (vial only)

Description	Volume	Color	100-pk.	1,000-pk.
Vial w/White Graduated Marking Spot	2.0 mL	Clear	24619	24620
Vial w/White Graduated Marking Spot	2.0 mL	Amber	24621	24622

2.0 mL, 8 mm Caps and Septa (preassembled)

Cap Color	Septa Material	100-pk.	1,000-pk.
Black	Red PTFE/Silicone, 0.065"	21149	21720
Black Top Hat	PTFE/Silicone	21721	21722

Caps & Septa for 2.0 mL, 8 mm Screw-Thread Vials

Description	Septa Material	100-pk.	1,000-pk.
Black Polypropylene, Open-Hole Caps		21176	21177
Septa, 8 mm x 0.045"	Red PTFE/Silicone	21178	21179
Septa, 8 mm x 0.065"	Red PTFE/White Silicone	21795	21147

2.0 mL Autosampler Vial Convenience Kits

- Vials packaged in a clear-lid tray. Preassembled caps with septa packaged separately in a plastic bag.
- Black polypropylene open-hole caps and 8 mm red PTFE/silicone septa, 0.065".

Description	100-pk.	1,000-pk.
Clear 2.0 mL Vial, Silcote CL7-Deactivated, Black Cap, Red PTFE/Silicone Septa, 0.065"	24638	24639
Amber 2.0 mL Vial, Silcote CL7-Deactivated, Black Cap, Red PTFE/Silicone Septa, 0.065"	24640	24641
Clear 2.0 mL Vial, Untreated, Black Cap, Red PTFE/Silicone Septa, 0.065"	21192	21193
Amber 2.0 mL Vial, Untreated, Black Cap, Red PTFE/Silicone Septa, 0.065"	21194	21195

2.0 mL Preassembled Vial Kits

8 mm/425 Screw-Thread, Unmarked Vials, Septa, and Caps

Caps attached to vials.

Description	100-pk.	1,000-pk.
Clear 2.0 mL Vial, Black Cap, Red PTFE/Silicone Septa, 0.045"	24630	24631
Amber 2.0 mL Vial, Black Cap, Red PTFE/Silicone Septa, 0.045"	24632	24633



24658

4.0 mL WISP 48 style vials are compatible with Shimadzu AOC-14/1400, AOC-17, and SIL-2AS instruments.

4.0 mL WISP 48 Crimp-Top 13 mm Vials, 15 x 45 mm, Snap Seal

4.0 mL WISP 48 Crimp-Top Vial (vial only)

Description	Volume	Color	100-pk.	1,000-pk.
WISP 48 Snap Seal Vial w/White Graduated Marking Spot	4.0 mL	Clear	24658	24659

Aluminum Seals w/Septa for 4.0 mL WISP Crimp-Top Vials

Seal Color	Septa Material	100-pk.	1,000-pk.
Silver	PTFE/Natural Rubber	21753	21754
Silver	PTFE/Silicone	21755	21756

instrument reference

For 4.0 mL WISP 48-Style Vials

The following instruments are compatible with 4.0 mL WISP 48-style vials. For more information or questions, please contact your Restek sales representative or technical service.

Manufacturer	Instrument/Model #	Manufacturer	Instrument/Model #
Bruker	LC 51	TosoHaas	TSK-6080, AS-8010, AS-8020
Hitachi	L-7200, L7250	Unicam	LC-XP
Phillips	LC-XP	Waters	48-pos. M700, T10, T17+
Shimadzu	AOC-14/1400, AOC-17, SIL-2AS		

Autosampler Syringes for Shimadzu GCs

- Hamilton and SGE syringes are designed and tested to meet critical autosampler performance needs.
- Needle point styles are designed to withstand multiple, rapid injections through a septum.

Hamilton for Shimadzu AOC 9 GCs

Volume	Needle Term.	Needle Gauge	Needle Length	Point Style	Hamilton			Restek
					Model	cat.#	qty.	cat.#
5 µL	RN	26s	2"/51 mm	2	75RN	87930	ea.	24617
5 µL	N	26s	2"/51 mm	2	75N	87900	ea.	24938
10 µL	RN	26s	2"/51 mm	2	701RN	80330	ea.	24530

SGE for Shimadzu AOC 14, 17, 20, and 20i GCs

Volume	Needle Term.	Needle Gauge	Needle Length	Point Style	SGE			Restek
					Model	cat.#	qty.	cat.#
0.5 µL	R	23	42 mm	Cone	0.5BR-S-0.63	000445	ea.	24841
0.5 µL	R	26	42 mm	Cone	0.5BR-S-0.47	000440	ea.	24840
5 µL	F	23	42 mm	Cone	5F-S-0.63	001988	ea.	24843
5 µL	F	26	42 mm	Cone	5F-S-0.47	001987	ea.	24842
10 µL	R	23	42 mm	Cone	10R-S-0.63	002898	ea.	24845
10 µL*	R	23	42 mm	Cone	10R-S-GT-0.63	002902	ea.	24846
10 µL	R	26	42 mm	Cone	10R-S-0.47	002897	ea.	24844
250 µL*	F	23	42 mm	Cone	250F-S-GT-0.63	006682	ea.	24847

*Gas-tight syringe.



Replacement Needles for Shimadzu Autosampler Syringes

SGE

Syringe Volume	Needle Gauge	Needle Length	Point Style	SGE cat.#	qty.	Restek cat.#
0.5 µL	23	42 mm	Cone	033745	ea.	24747
0.5 µL	26	42 mm	Cone	033738	ea.	24746
10 µL	23	42 mm	Cone	037747	2-pk.	24749
10 µL	26	42 mm	Cone	037745	2-pk.	24748



Guide to Needle Termination Codes

Hamilton:

- (N) Cemented Needle
- (RN) Removable Needle

SGE:

- (F) Fixed Needle
- (R) Removable Needle

Overview of Restek Ultra-High Purity (UHP) Gas Regulators

- Regulators feature metal-to-metal seals throughout for long-term leak-tightness.
- Metal diaphragm outlet valve ensures gas purity.
- Each regulator is helium leak-test-certifiable to 1×10^{-8} scc/sec.
- Temperature range: -40 °C to 60 °C.

Ultra-High Purity (UHP) Brass Body Gas Regulators

UHP brass regulators are the best choice when using ultra-high purity carrier gas for sensitive GC applications using MS, PID, or ECD detection methods. They feature reduced internal dead-volume relative to stainless steel bodies. The metal valve diaphragm ensures leak-free shutoff. Oxidation-resistant chrome plating maintains a like-new appearance.

Dual-Stage Ultra-High Purity Chrome-Plated Brass Gas Regulators

- Oxidation-resistant, chrome-plated.
- Most stable outlet pressure control.
- Secondary pressure regulation not needed.
- Most widely used regulator.
- Less internal volume than stainless steel gas regulators.



Inlet gauge: 0 to 4,000 psig (0–27,579 kPa)
Outlet assembly: diaphragm valve, $\frac{1}{4}$ " tube fitting

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#
CGA 580 (N ₂ , He, Ar)	0 to 100 psig (0–689 kPa)	30" – 0 to 200 psig (0–1,379 kPa)	ea.	21667
CGA 350 (H ₂ , P ₂)	0 to 100 psig (0–689 kPa)	30" – 0 to 200 psig (0–1,379 kPa)	ea.	21668
CGA 590 (Air)	0 to 100 psig (0–689 kPa)	30" – 0 to 200 psig (0–1,379 kPa)	ea.	21669
DIN 477 #1 (H ₂)	0 to 7 bar (0–100 psig)	30" – 0 to 14 bar (0–200 psig)	ea.	22369
DIN 477 #6 (He, Ar)	0 to 7 bar (0–100 psig)	30" – 0 to 14 bar (0–200 psig)	ea.	22368
DIN 477 #9 (Air)	0 to 7 bar (0–100 psig)	30" – 0 to 14 bar (0–200 psig)	ea.	22370
DIN 477 #10 (N ₂)	0 to 7 bar (0–100 psig)	30" – 0 to 14 bar (0–200 psig)	ea.	22371

NOTE: CGA fittings are for U.S. use; DIN fittings are for European use.

Single-Stage Ultra-High Purity Chrome-Plated Brass Gas Regulators

- Oxidation-resistant, chrome-plated.
- Use when there is secondary pressure regulation downstream.
- Identical gas purity protection as with dual-stage gas regulators.

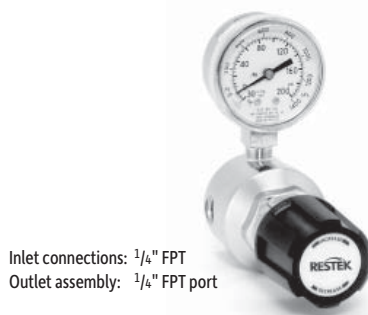
Inlet gauge: 0 to 4,000 psig (0–27,579 kPa)
Outlet assembly: diaphragm valve, $\frac{1}{4}$ " tube fitting

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#
CGA 580 (N ₂ , He, Ar)	0 to 100 psig (0–689 kPa)	30" – 0 to 200 psig (0–1,379 kPa)	ea.	20646
CGA 350 (H ₂ , P ₂)	0 to 100 psig (0–689 kPa)	30" – 0 to 200 psig (0–1,379 kPa)	ea.	20647
CGA 590 (Air)	0 to 100 psig (0–689 kPa)	30" – 0 to 200 psig (0–1,379 kPa)	ea.	20648
DIN 477 #1 (H ₂)	0 to 7 bar (0–100 psig)	30" – 0 to 14 bar (0–200 psig)	ea.	22373
DIN 477 #6 (He, Ar)	0 to 7 bar (0–100 psig)	30" – 0 to 14 bar (0–200 psig)	ea.	22372
DIN 477 #9 (Air)	0 to 7 bar (0–100 psig)	30" – 0 to 14 bar (0–200 psig)	ea.	22374
DIN 477 #10 (N ₂)	0 to 7 bar (0–100 psig)	30" – 0 to 14 bar (0–200 psig)	ea.	22375

NOTE: CGA fittings are for U.S. use; DIN fittings are for European use.

Ultra-High Purity Chrome-Plated Brass Line Gas Regulator

- Oxidation-resistant, chrome-plated.
- Use where you need to reduce the line pressure by 20 psig (138 kPa) or more.
- Same purity protection as high-pressure cylinder regulators.



Inlet connections: $\frac{1}{4}$ " FPT
Outlet assembly: $\frac{1}{4}$ " FPT port

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#
$\frac{1}{4}$ " female NPT ports*	0–50 psig (0–345 kPa)	30" – 0 to 100 psig (0–689 kPa)	ea.	21666
$\frac{1}{4}$ " female NPT ports*	0–100 psig (0–689 kPa)	30" – 0 to 200 psig (0–1,379 kPa)	ea.	22452

*Order appropriate male connector, pipe-to-tube fittings.

Swagelok® Male Connector, Pipe-to-Tube Fittings

Fitting Type	Size (inches)	Similar to Swagelok	Brass		Stainless Steel	
			qty.	cat.#	qty.	cat.#
Male Connector	$\frac{1}{4}$ " to $\frac{1}{8}$ " NPT	400-1-4	10-pk.	23134	2-pk.	23184
Male Connector	$\frac{1}{8}$ " to $\frac{1}{4}$ " NPT	200-1-4	10-pk.	23136	2-pk.	23186
Tube End Reducer	$\frac{1}{4}$ " to $\frac{1}{8}$ "	200-R-4	5-pk.	23129	2-pk.	23179



Ultra-High Purity (UHP) Stainless Steel Body Gas Regulators

UHP stainless steel regulators are the standard for ultra-high-purity and corrosion-resistant pressure regulation. They are more easily purged of atmospheric components compared to brass gas regulators, making them ideal for the most demanding applications. Stainless steel is especially useful in atmospheres of dry corrosive gases such as hydrogen.

Dual-Stage Ultra-High Purity Stainless Steel Gas Regulators

- Most stable outlet pressure control.
- Secondary pressure regulation not needed.

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#
CGA 580 (N ₂ , He, Ar)	0 to 100 psig (0–689 kPa)	30" – 0 to 200 psig (0–1,379 kPa)	ea.	20662
CGA 350 (H ₂ , P ₂)	0 to 100 psig (0–689 kPa)	30" – 0 to 200 psig (0–1,379 kPa)	ea.	20663
CGA 590 (Air)	0 to 100 psig (0–689 kPa)	30" – 0 to 200 psig (0–1,379 kPa)	ea.	20664
DIN 477 #1 (H ₂)	0 to 7 bar (0–100 psig)	30" – 0 to 14 bar (0–200 psig)	ea.	22377
DIN 477 #6 (He, Ar)	0 to 7 bar (0–100 psig)	30" – 0 to 14 bar (0–200 psig)	ea.	22376
DIN 477 #9 (Air)	0 to 7 bar (0–100 psig)	30" – 0 to 14 bar (0–200 psig)	ea.	22378
DIN 477 #10 (N ₂)	0 to 7 bar (0–100 psig)	30" – 0 to 14 bar (0–200 psig)	ea.	22379

NOTE: CGA fittings are for U.S. use; DIN fittings are for European use.

Single-Stage Ultra-High Purity Stainless Steel Gas Regulators

- Use when there is secondary pressure regulation downstream.
- Identical gas purity protection as with dual-stage gas regulators.

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#
CGA 580 (N ₂ , He, Ar)	0 to 100 psig (0–689 kPa)	30" – 0 to 200 psig (0–1,379 kPa)	ea.	20665
CGA 350 (H ₂ , P ₂)	0 to 100 psig (0–689 kPa)	30" – 0 to 200 psig (0–1,379 kPa)	ea.	20666
CGA 590 (Air)	0 to 100 psig (0–689 kPa)	30" – 0 to 200 psig (0–1,379 kPa)	ea.	20667
DIN 477 #1 (H ₂)	0 to 7 bar (0–100 psig)	30" – 0 to 14 bar (0–200 psig)	ea.	22380
DIN 477 #6 (He, Ar)	0 to 7 bar (0–100 psig)	30" – 0 to 14 bar (0–200 psig)	ea.	22445
DIN 477 #9 (Air)	0 to 7 bar (0–100 psig)	30" – 0 to 14 bar (0–200 psig)	ea.	22446
DIN 477 #10 (N ₂)	0 to 7 bar (0–100 psig)	30" – 0 to 14 bar (0–200 psig)	ea.	22447

NOTE: CGA fittings are for U.S. use; DIN fittings are for European use.

Flexible Stainless Steel Hoses

Description	Length	Fittings	qty.	cat. #
Flexible Stainless Steel Hose	36"	1/4" Female NPT	ea.	21339
Flexible Stainless Steel Hose	18"	1/4" Female NPT	ea.	21340

Flammable Gas Flash Arrestor—Factory Mutual Approved*

- Gas flow shuts off in the event of a flashback.
- Flame extinguished—flame front prevented from reaching the gas supply.
- No gas flow restriction under normal operating conditions.

Description	Fittings	qty.	cat.#
Flammable Gas Flash Arrestor, Brass Body	1/4" NPTF	ea.	21334

*Approved for brass body servicing hydrogen, acetylene, propane, or natural gas only.

CGA Fittings

CGA-specified nuts and nipples with internal frit, 1/4-inch NPT nickel-plated brass.

Description	qty.	cat.#
CGA 580 Fitting, (N ₂ , He, Ar)	ea.	21336
CGA 350 Fitting, (H ₂ , P ₂)	ea.	21337
CGA 590 Fitting, (Air)	ea.	21338



Inlet gauge: 0 to 4,000 psig (0–27,579 kPa)
Outlet assembly: diaphragm valve, 1/4" tube fitting

Inlet gauge: 0 to 4,000 psig (0–27,579 kPa)
Outlet assembly: diaphragm valve, 1/4" tube fitting



21334



21336

ordering note

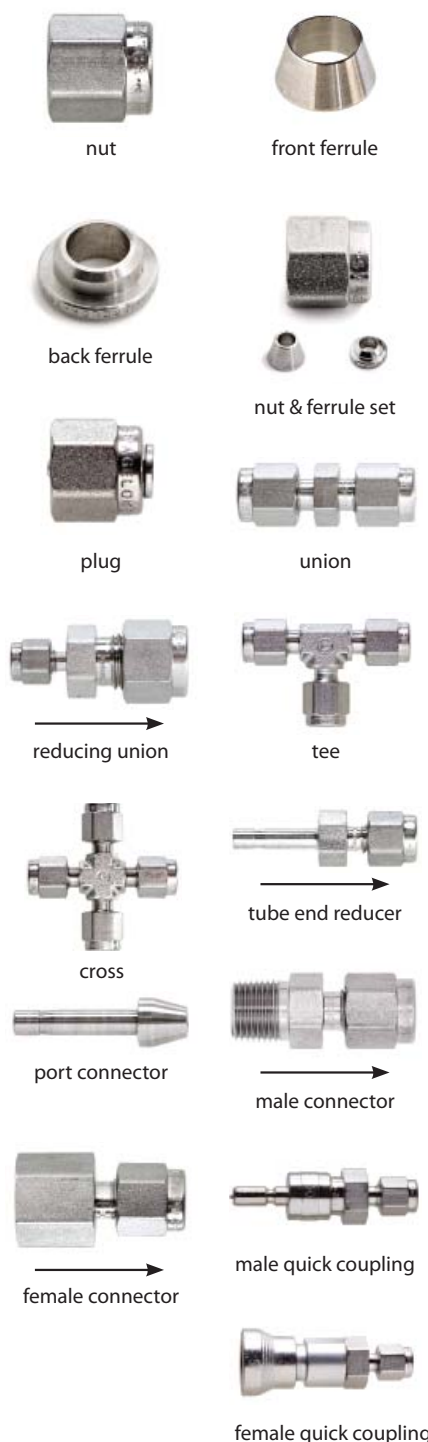
International Fittings

All gas regulators are available with the following BS (British Standard) and DIN (German Industrial Standards Organization) connections. Please contact your local Restek representative for more information.

BS 341 #01	BS 341 #08	BS 341 #15	DIN 477 #06	DIN 477 #10	DIN 477 #14
BS 341 #02	BS 341 #10	DIN 477 #01	DIN 477 #07	DIN 477 #11	DIN 477 #15
BS 341 #03	BS 341 #13	DIN 477 #03	DIN 477 #08	DIN 477 #12	
BS 341 #04	BS 341 #14	DIN 477 #05	DIN 477 #09	DIN 477 #13	

Swagelok® Fittings (Brass & Stainless Steel)

Restek is pleased to offer one of the premier lines of fittings available for chromatographers in the market today. We can supply the entire line of Swagelok® fittings. If you don't see the exact product you're looking for, please call us or contact your Restek representative for a quote.



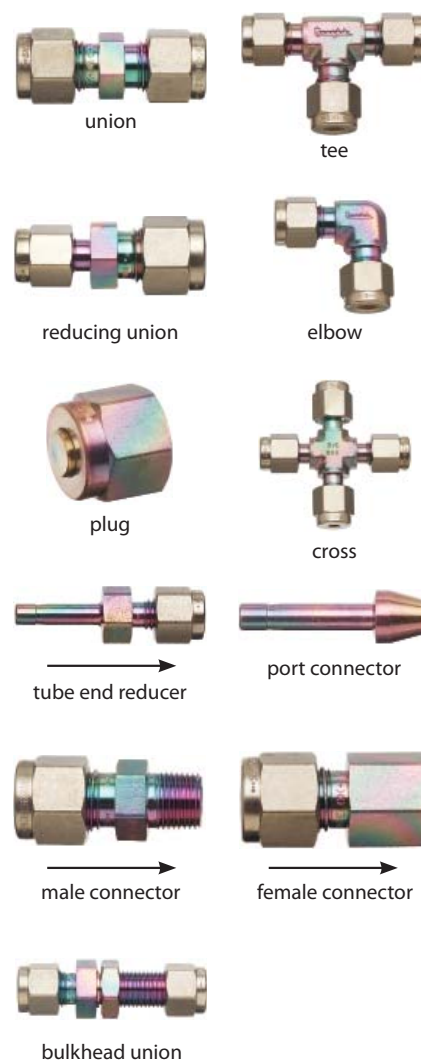
Fitting Type	Size	Swagelok #	Brass		316 Grade Stainless Steel	
			qty.	cat.#	qty.	cat.#
Nut	1/16"	102-1	20-pk.	23100	5-pk.	23150
	1/8"	202-1	40-pk.	23101	10-pk.	23151
	1/4"	402-1	40-pk.	23102	10-pk.	23152
Front Ferrule	1/16"	103-1	20-pk.	23103	10-pk.	23153
	1/8"	203-1	40-pk.	23104	20-pk.	23154
	1/4"	403-1	40-pk.	23105	20-pk.	23155
Back Ferrule	1/16"	104-1	20-pk.	23106	10-pk.	23156
	1/8"	204-1	40-pk.	23107	20-pk.	23157
	1/4"	404-1	40-pk.	23108	20-pk.	23158
Nut & Ferrule Set	1/16"		10-pk.	23109	2-pk.	23159
	1/8"		20-pk.	23110	5-pk.	23160
	1/4"		20-pk.	23111	5-pk.	23161
Plug	1/16"	100-P	5-pk.	23112	2-pk.	23162
	1/8"	200-P	10-pk.	23113	4-pk.	23163
	1/4"	400-P	10-pk.	23114	4-pk.	23164
Union	1/16"	100-6	3-pk.	23115	ea.	23165
	1/8"	200-6	5-pk.	23116	2-pk.	23166
	1/4"	400-6	5-pk.	23117	2-pk.	23167
Reducing Union	1/8" to 1/16"	200-6-1	5-pk.	23118	ea.	23168
	1/4" to 1/16"	400-6-1	5-pk.	23119	2-pk.	23169
	1/4" to 1/8"	400-6-2	5-pk.	23120	2-pk.	23170
Tee	1/16"	100-3	2-pk.	23121	ea.	23171
	1/8"	200-3	2-pk.	23122	ea.	23172
	1/4"	400-3	2-pk.	23123	ea.	23173
Cross	1/8"	200-4	2-pk.	23124	ea.	23174
	1/4"	400-4	2-pk.	23125	ea.	23175
Tube End Reducer	1/8" to 1/16"	100-R-2	5-pk.	23126	2-pk.	23176
	1/4" to 1/16"	100-R-4	5-pk.	23127	2-pk.	23177
	1/8" to 1/4"	400-R-2	5-pk.	23128	2-pk.	23178
	1/4" to 1/8"	200-R-4	5-pk.	23129	2-pk.	23179
Port Connector	1/8"	201-PC	5-pk.	23130	2-pk.	23180
	1/4"	401-PC	10-pk.	23131	2-pk.	23181
	1/8" to 1/4"	401-PC-2	5-pk.	23132	2-pk.	23182
Male Connector	1/8" to 1/8" NPT	200-1-2	10-pk.	23133	2-pk.	23183
	1/4" to 1/4" NPT	400-1-4	10-pk.	23134	2-pk.	23184
	1/16" to 1/8" NPT	100-1-2	5-pk.	23135	2-pk.	23185
	1/8" to 1/4" NPT	200-1-4	10-pk.	23136	2-pk.	23186
	1/4" to 1/8" NPT	400-1-2	10-pk.	23137	2-pk.	23187
Female Connector	1/8" to 1/8" NPT	200-7-2	5-pk.	23138	2-pk.	23188
	1/4" to 1/4" NPT	400-7-4	5-pk.	23139	2-pk.	23189
	1/4" to 1/8" NPT	400-7-2	5-pk.	23140	2-pk.	23190
Male & Female Quick Couplings	1/8" male*	QC4D-200	—	—	ea.	23191
	1/8" male	QC4S-200	—	—	ea.	23192
	1/8" female*	QC4B-200	—	—	ea.	23193
	1/4" male*	QC4D-400	—	—	ea.	23194
	1/4" male	QC4S-400	—	—	ea.	23195
	1/4" female*	QC4B-400	—	—	ea.	23196

*Includes self-sealing shutoff valve.

Swagelok® Fittings (Siltek®/Sulfinert® & Silcosteel®-CR Treated)

- Full line of treated $1/16$ ", $1/8$ ", and $1/4$ " fittings.
- Silcosteel®-CR treatment enhances corrosion resistance by 10x or more.
- For custom treatment on any Swagelok® fitting or other system parts not listed here, call us or contact your Restek representative.

Fitting Type	Size	Swagelok #	Siltek/Sulfinert Treated		Silcosteel-CR Treated	
			qty.	cat.#	qty.	cat.#
Union	$1/16$ "	SS-100-6	ea.	22540	ea.	22575
	$1/8$ "	SS-200-6	ea.	22541	ea.	22576
	$1/4$ "	SS-400-6	ea.	22542	ea.	22577
	$3/8$ "	SS-600-6	ea.	22909	ea.	22904
Tee	$1/16$ "	SS-100-3	ea.	22543	ea.	22578
	$1/8$ "	SS-200-3	ea.	22544	ea.	22579
	$1/4$ "	SS-400-3	ea.	22545	ea.	22580
	$3/8$ "	SS-600-3	ea.	22910	ea.	22905
Reducing Union	$1/8$ " to $1/16$ "	SS-200-6-1	ea.	22546	ea.	22581
	$1/4$ " to $1/16$ "	SS-400-6-1	ea.	22547	ea.	22582
	$1/4$ " to $1/8$ "	SS-400-6-2	ea.	22548	ea.	22583
	$3/8$ " to $1/4$ "	SS-600-6-4	ea.	22911	ea.	22906
Elbow	$1/8$ "	SS-200-9	ea.	22549	ea.	22584
	$1/4$ "	SS-400-9	ea.	22550	ea.	22585
Plug	$1/8$ "	SS-200-P	ea.	22573	ea.	22620
	$1/4$ "	SS-400-P	ea.	22574	ea.	22597
Cross	$1/8$ "	SS-200-4	ea.	22551	ea.	22586
	$1/4$ "	SS-400-4	ea.	22552	ea.	22587
Tube End Reducer	$1/8$ " tube to $1/16$ "	SS-100-R-2	ea.	22553	ea.	22588
	$1/4$ " tube to $1/16$ "	SS-100-R-4	ea.	22554	ea.	22589
	$1/8$ " tube to $1/4$ "	SS-400-R-2	ea.	22555	ea.	22590
	$1/4$ " tube to $1/8$ "	SS-200-R-4	ea.	22556	ea.	22591
Port Connector	$1/8$ "	SS-201-PC	ea.	22557	ea.	22592
	$1/4$ "	SS-401-PC	ea.	22558	ea.	22593
	$1/8$ " tube to $1/4$ "	SS-401-PC-2	ea.	22559	ea.	22594
Male Connector	$1/8$ " to $1/8$ " NPT	SS-200-1-2	ea.	22561	ea.	22595
	$1/4$ " to $1/4$ " NPT	SS-400-1-4	ea.	22562	ea.	22596
	$1/16$ " to $1/8$ " NPT	SS-100-1-2	ea.	22563	ea.	22610
	$1/8$ " to $1/4$ " NPT	SS-200-1-4	ea.	22564	ea.	22611
	$1/4$ " to $1/8$ " NPT	SS-400-1-2	ea.	22565	ea.	22612
	$3/8$ " to $3/8$ " NPT	SS-600-1-6	ea.	22912	ea.	22907
Female Connector	$1/8$ " to $1/8$ " NPT	SS-200-7-2	ea.	22566	ea.	22613
	$1/4$ " to $1/4$ " NPT	SS-400-7-4	ea.	22567	ea.	22614
	$1/4$ " to $1/8$ " NPT	SS-400-7-2	ea.	22568	ea.	22615
	$1/8$ " to $1/4$ " NPT	SS-200-7-4	ea.	22569	ea.	22616
Bulkhead Union	$1/8$ "	SS-200-61	ea.	22570	ea.	22617
	$1/4$ "	SS-400-61	ea.	22571	ea.	22618

**Swagelok® Fitting Kits**

Save more than 40% by purchasing a Restek Swagelok® fittings kit compared to paying full price for the individual parts!

- Includes the most common assortment of $1/8$ " and $1/4$ " brass or stainless steel fittings.
- Parts list makes reordering easy.
- Parts come in sturdy toolbox for easy and convenient storage.



Description	qty.	cat.#
Swagelok Fitting Kit, Brass	kit	23141

Description	qty.	cat.#
Swagelok Fitting Kit, Stainless Steel	kit	23197



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