

Genuine Restek Replacement Parts for **Shimadzu GCs**



HROMalytic **RESTEK** '07
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RESTEK

Chromatography Products

www.restek.com 800-356-1688 • 814-353-1300

From Injector to Detector

Restek is your #1 source for consumables and supplies for Shimadzu GCs!

Genuine Restek Replacement Parts

We take a position of advocacy through quality in the innovative manufactured products and the selected resale products we offer. Our reputation has been built on supplying superior-quality manufactured parts, accessories, and operating supplies for gas chromatography. We do whatever it takes to provide you with the best—from our own innovative designs to original equipment manufacturers' replacement parts. Our consumables and parts will help you maintain optimum system performance, and give you the convenience and economy of one-stop shopping for all your GC needs.



Donna Lidgett

Product Marketing Manager, GC Accessories
20+ Years of Service

Donna Lidgett

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Restek Performance Coatings

As needs for improved performance of system components increase, coatings often are an effective solution. Restek's Performance Coatings Division specializes in innovative surface treatments for steel, stainless steel, alloys, glass, and other materials. Our surface treatments increase resistance to corrosion, reduce interactions between steel surfaces and active compounds, inhibit coking on process system surfaces, and offer many other advantages.

Restek's involvement in coatings began in 1987. The focus of our initial work was to produce a coating on stainless steel that would be inert to low levels of reactive organic compounds, such as explosives and volatile organic compounds (VOCs). The end product from this work was the Silcosteel® surface treatment for stainless steel tubing. Silcosteel® treated tubing currently is used for constructing analytical testing equipment by all major manufacturers of gas chromatography sampling and testing instruments.

Since this initial project, our coatings experts have developed a family of surface treatments to address other specific needs, and thereby enhance the performance of system components. Products of our processes are more correctly described as surface treatments, rather than as coatings, because, unlike coatings, the introduced layer permeates and chemically bonds to the treated surface. And unlike coatings, this layer cannot chip, flake, or blister. In brief, these treatments are:

- **Silcosteel®**—A general purpose passivation layer for steel and stainless steel. US Patent 6,511,760.
- **Siltek®**—The ultimate passivation of treated surfaces, from glass to high nickel alloys of steel. US Patent 6,444,326.
- **Silcosteel®-AC**—Dramatically reduces carbon buildup on stainless steel components. US Patent 6,444,326.
- **Silcosteel®-CR**—A corrosion resistant layer that increases the lifetime of system components in acidic environments containing hydrochloric acid, nitric acid, or seawater. US Patent 7,070,833.
- **Silcosteel®-UHV**—Greatly reduces outgassing from components of ultra-high vacuum systems. US Patent 7,070,833.
- **Sulfinert®**—A required treatment for metal components when analyzing for parts-per-billion levels of organo-sulfur compounds. US Patent 6,444,326.

Restek surface treatments are now used in many applications, spanning multiple industries and market areas. Restek coated components increase the lifetime of stack monitoring equipment. Treated injector nozzles have longer service life because coking is inhibited. Sulfinert® treated sampling equipment increases the reliability of process measurements in refineries and petrochemical plants. A mass spectrometer manufacturer demands Silcosteel® treated parts to increase instrument sensitivity for analyzing pesticides. Restek coated air sampling equipment is used in applications as diverse as sampling city air and monitoring submarine cabins.



it's a **fact**

All treatments are **total and uniform**: all pockets, holes, corners, and channels are coated evenly.

Siltek®/Sulfinert® Treatment

Feature

Benefit

Inert.	Sample, transfer, and analyze sulfur compounds and other active compounds at parts-per-billion levels.
Durable and flexible layer, incorporated into the surface.	Items can be worked after treatment—no flaking, chipping, or cracking.
Stable in acidic or weakly basic (pH 8-9) environments.	Sample sulfur compounds without compromising compound stability.
Tested thermal stability to 450°C in an inert atmosphere.	Effectively bake-out contaminants.
Non-polymeric.	No memory effects, as seen with Teflon®-coated parts.
Treated tubing and fittings in stock for immediate delivery.	Parts are available when you need them.



Siltek® treatment provides the ultimate passivation for many surfaces, from glass to high nickel alloys of steel.

Restek Electronic Leak Detector



Small, compact unit—easy to hold and operate.

Restek Electronic Leak Detector

- Reliable thermal conductivity leak detector.
- Responds to leaks in less than 2 seconds.
- Audible alarm plus LED readout.
- Auto zeros with the touch of a button.
- Built-in rechargeable 9 volt battery.

Improve GC Performance; Save Your Column!

Avoid poor chromatography caused by leaks—leak check your GC system with the Restek Electronic Leak Detector, the affordable, reliable tool for detecting leaks. Features include internal battery charge capability, a low-battery indicator, a battery charge indicator light, yellow lights to signal a nitrogen leak, a repositioned on/off switch to eliminate accidentally powering on the unit, and a probe tip design that prevents debris from entering the unit. The leak detector's microchip technology enables high sensitivity in a compact unit, the autozero feature allows instantaneous zeroing with the touch of a button, and the ergonomic design puts all controls at your fingertips, for maximum ease of use.

Leaks can cause detector noise and baseline instability, waste carrier gas, and shorten column lifetimes, so leak checks should be a regular part of a GC maintenance program. The Restek Electronic Leak Detector responds in less than 2 seconds to leaks of gases with thermal conductivities different from air, indicating leaks with both an audible alarm and an LED readout. The leak detector detects minute gas leaks that can go undetected by liquid leak detectors. Never use liquid leak detectors on a capillary GC system; liquids drawn into the system through the leaks will contaminate the system.

How does the Restek Electronic Leak Detector work?

The Restek Electronic Leak Detector detects minute leaks of any gas with a thermal conductivity different from air. The reference gas inlet draws in ambient air for comparison to air drawn into the sample probe. A thermal conductivity difference between the two indicates a leak, and the leak is revealed to the user by both an LED bar graph and an audible tone. The leak detector operates on one rechargeable 9-volt Ni-MH battery (included).

Leak Detector Facts

Detectable gases:	helium, nitrogen, argon, carbon dioxide
Battery:	Rechargeable Ni-MH, 9 volt
Operating Temperature Range:	32°-120°F (0°-48°C)
Humidity Range:	0-97%
CE Approved:	Yes



Easy-to-clean probe assembly

tech tip

Avoid poor chromatography caused by leaks—leak check with the Restek Electronic Leak Detector.

Description	qty.	cat.#
Leak Detector with 110Volt Battery Charger	ea.	22451
Leak Detector with 220Volt European Battery Charger	ea.	22451-EUR
Leak Detector with 220Volt UK Battery Charger	ea.	22451-UK

Caution: The Restek Electronic Leak Detector is NOT designed for determining leaks of combustible gases. A combustible gas detector should be used for determining combustible gas leaks under any condition. The Restek Electronic Leak Detector may be used for determining trace amounts of hydrogen in a GC environment only.

Leak Detector Accessory Kit

The kit includes an adaptor fitting to detect leaks in hard-to-reach locations, and a mounting bracket that can be affixed to the wall or GC.



Verify hard-to-reach leaks with the adaptor fitting.



Leak Detector is easily accessed when stored in the mounting bracket.

Description	qty.	cat.#
Leak Detector Accessory Kit (adaptor fitting for probe, mounting bracket)	kit	22453

tech tip

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

Liner Deactivations

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.

Siltek® Deactivation

- Revolutionary deactivation for difficult matrices and reactive compounds.
- Inertness retained over a wide sample pH range.
- Minimal bleed.
- Ideal for chlorinated pesticide analysis; lowers endrin breakdown to less than 1%.
- Recommended for use with Rtx®-CLPesticides, Stx™-CLPesticides, Stx™-1HT, and Rtx®-TNT columns.

Base Deactivation

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

All liners are
100%
deactivated

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

Siltek® Deactivation—The Next Generation

- 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 Siltek® deactivation process (US Patent 6,444,326) 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	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-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	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

← Ideal for amines and basic compounds!

a plus 1 story

“I installed Siltek® liners on one of our GCs to replace standard quartz liners that required deactivating daily. I found the results to be excellent, saving many hours of instrument time with no detrimental effects on the analysis.”

Matthew Turner, Laboratory Manager—food contaminants, Global Analysis (UK)

Inlet Liner Packing Materials & Accessories

Why Use Deactivated Wool for a Liner Packing?

- Ensure uniform vaporization in split or splitless liners.
- Prolong column life by trapping septum particles.
- Recommended for autosamplers with fast injection rates.
- Inertness tested for endrin breakdown.

Deactivated Wool

Further improving our proprietary deactivation process, we make this deactivated wool more inert than our traditional fused silica wool, yet it is as flexible as our traditional borosilicate glass wool.

Description	qty.	cat.#
Deactivated Wool	10 grams	24324



Base-Deactivated Wool

Ideal for amines and other basic compounds.

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

Mini Wool Puller/Inserter

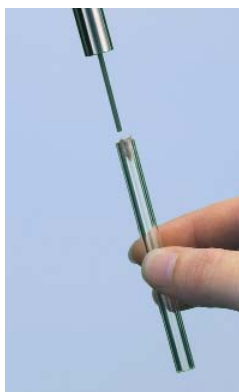
Insert and remove wool plugs easily. Order a spare pack so you'll always have one available.



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

Inlet Liner Packing Tool

- Easy to use—position wool reproducibly every time.
- Accurate to a specific, measured depth.



Eliminates user variation!



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

Prepacked Inlet Liners

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

qty.	Wool	FS Beads	CarboFrit™†
ea.	-200.1	-201.1	-209.1
5-pk.	-200.5	-201.5	-209.5
25-pk.	-200.25	-201.25	-209.25

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

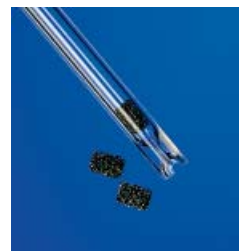
CarboFrit™ Inlet Liner Packing Material

- 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- inserter tool listed below.*

Add the corresponding suffix number to the liner catalog number.

Description	suffix	
each	-209.1	addl. cost
5-pk.	-209.5	addl. cost
25-pk.	-209.25	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. #
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. #
CarboFrit™ Puller/Inserter Tool	ea.	21642

**a plus 1 story**

"Restek sent us some carbon material (CarboFrit™) packing) with the suggestion to test it as liner packing. Initially, I didn't even want to try it because carbon is usually highly retentive and catalytically active. As we nevertheless gave it a chance, we were highly surprised...it exhibited low retentive power and good inertness."

excerpt from: *Sample Evaporation in Hot GC Injectors*,
Dr. Konrad Grob, *The Restek Advantage*, Winter 1996.

Deactivated Fused Silica Beads

- Increase sample vaporization surface and minimize splitter discrimination to improve quantitation of compounds having dissimilar boiling points.
- Trap non-volatile or inorganic residue to prevent column inlet contamination.
- Deactivated, heat-treated, and tested to ensure complete inertness.

Description	Mesh	qty.	cat. #
Deactivated Fused Silica Beads	60-80	25 grams	20791

**Inlet Liner Removal Tool**

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



No more burned fingers!












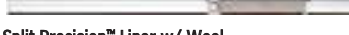

Description	qty.	cat. #
Inlet Liner Removal Tool	3-pk.	20181

**tech tip****Use of Packings with Splitless Liners**

We recommend using an injection port liner with wool or CarboFrit™ packing when making splitless 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 non-reproducible 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.

Inlet Liners

COLUMN INSTALLS THIS END

Split Liners for Shimadzu 9A GCs		Benefits/Uses:	ID*/OD & Length (mm)	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
	Split	universal, for most common analyses	3.5 ID 5.0 OD x 128	221-25822-01	20751	20752	20753
		dirty samples, many injections before cleaning required	3.5 ID 5.0 OD x 128	—	20754	20755	—
	Cycloplitter®	high & low MW compounds	3.5 ID 5.0 OD x 128	—	20757	20758	—
Cup Splitter							
Splitless Liners for Shimadzu 9A GCs		Benefits/Uses:	ID*/OD & Length (mm)	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
	3.5mm Splitless	trace samples	3.5 ID 5.0 OD x 128	221-25440-03	20748	20749	20750
DI Liners for Shimadzu 9A GCs (0.32/0.53mm ID)		Benefits/Uses	ID*/OD & Length (mm)	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
	Uniliner®	trace, active samples, high recovery & linearity	3.5 ID 5.0 OD x 128	—	20872	20873	—
Split Liners for Shimadzu 14A GCs		Benefits/Uses:	ID*/OD & Length (mm)	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
	Split	universal, for most common analyses	3.5 ID 5.0 OD x 99	221-32544-01	20860	20861	20862
		dirty samples, many injections before cleaning required	3.5 ID 5.0 OD x 99	—	20870	20871	—
	Cycloplitter®	high MW compounds	3.5 ID 5.0 OD x 99	—	20868	20869	—
Laminar Cup Splitter							
Splitless Liners for Shimadzu 14A GCs		Benefits/Uses:	ID*/OD & Length (mm)	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
	3.5mm Splitless	trace samples	3.5 ID 5.0 OD x 99	221-32544-00	20863	20864	20865
DI Liners for Shimadzu 14A GCs (0.32/0.53mm ID)		Benefits/Uses	ID*/OD & Length (mm)	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
	Uniliner®	trace, active samples, high recovery & linearity	3.5 ID 5.0 OD x 99	—	20876	20877	—
	Cyclo-Uniliner®	trace, dirty, high MW active samples, high recovery & linearity	3.5 ID 5.0 OD x 99	—	20893	20894	—
Split Liners for Shimadzu 17A, 2010, and 2014 GCs		Benefits/Uses:	ID*/OD & Length (mm)	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
	1mm Split	purge & trap, fast GC	1.0 ID 5.0 OD x 95	—	20976	20977	20978
	3.5mm Split	universal, for most common analyses	3.5 ID 5.0 OD x 95	221-41444-01	22283	22284	22285
	Split Precision™ Liner w/ Wool	dirty samples, trace samples	3.5 ID 5.0 OD x 95	—	21020	21021	—
	Cycloplitter®	dirty samples, many injections before cleaning required	3.5 ID 5.0 OD x 95	new!	22072	22073	—












*Nominal ID at syringe needle expulsion point.

ordering note

For descriptions of liner deactivations, packings, and tools, see [pages 3-5](#).

All liners are
100% deactivated



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

Splitless Liners for Shimadzu 17A, 2010, and 2014 GCs	Benefits/Uses:	ID*/OD & Length (mm)	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
 3.5mm Splitless	universal, trace samples	3.5 ID 5.0 OD x 95	221-48335-01	22286	22287	—
 Double Gooseneck	reduces backflash and catalytic decomposition	3.5 ID 5.0 OD x 95	—	20958	20959	20960
 Single Gooseneck	reduces backflash, also operates in DI mode	3.5 ID 5.0 OD x 95	221-41599-00	20961	20962	20963
Split/Splitless Liners for Shimadzu 17A, 2010, and 2014 GCs	Benefits/Uses:	ID*/OD & Length (mm)	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
 Split/Splitless w/ Wool	universal, for most common analyses	3.5 ID 5.0 OD x 95	221-41444-00	20955	20956	20957
 Siltek® Split/Splitless w/ Wool	universal, for most common analyses	3.5 ID 5.0 OD x 95	—	20955-213.1	20956-213.5	20957-213.25
SPME Liner for Shimadzu 17A, 2010, and 2014 GCs	Benefits/Uses	ID*/OD & Length (mm)	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
 SPME Liner	ideal for low volume SPME applications	.75 ID 5.0 OD x 95	new!	22278	22279	—
DI Liners for Shimadzu 17A, 2010, and 2014 GCs (0.32/0.53mm ID)	Benefits/Uses	ID*/OD & Length (mm)	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
 Uniliner® w/ Wool	trace, dirty, high MW active samples, high recovery & linearity	3.5 ID 5.0 OD x 95	—	21713	21719	—
 Open-top Drilled Uniliner® (hole on top)	trace, active samples, high recovery & linearity	3.5 ID 5.0 OD x 95	—	21285	21286	—
 Open-top Drilled Uniliner® (hole on bottom)	trace, active samples, high recovery & linearity	3.5 ID 5.0 OD x 95	—	21287	21288	—
 Gooseneck Drilled Uniliner® (hole on top)	trace, active samples, high recovery & linearity	3.5 ID 5.0 OD x 95	—	21289	21290	—
 Gooseneck Drilled Uniliner® (hole on bottom)	trace, active samples, high recovery & linearity	3.5 ID 5.0 OD x 95	—	21291	21292	—

tech tip

DI Liners for Shimadzu GCs

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

Liner for Shimadzu 17A PTV GCs	Benefits/Uses	ID*/OD & Length (mm)	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
 17A PTV Liner w/ Wool	trace, dirty, high & low MW active samples	1.6 ID 4.0 OD x 95	225-09212-01	21705	21706	21707
Make-up Liner for Shimadzu GCs	Benefits/Uses	ID*/OD & Length (mm)	Similar to Shimadzu part #	ea.	cat.# 5-pk.	25-pk.
 Detector Make-up Liner	FIDs, ECDs & misc. detectors	1.0 ID 5.0 OD x 75	—	20760	20761	—

*Nominal ID at syringe needle expulsion point.

Siltek® Treated Metal Inlet Liners for Shimadzu GCs

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

SILTEK®
deactivation



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

**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.	21477

**Graphite O-Rings for Shimadzu 17A, 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

**Plug Septa for Shimadzu GCs**

Thermolite® Septa (useable to 340°C inlet temp.)		IceBlue™ Septa (useable to 250°C inlet temp.)		BTO® Septa (useable to 400°C inlet temp.)	
qty.	cat.#	qty.	cat.#	qty.	cat.#
25-pk.	27153	50-pk.	27170	50-pk.	27118
50-pk.	27154	100-pk.	27171	100-pk.	27119
100-pk.	27155				

**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.#
	221-41286-00		
Septum Nut for Shimadzu 17A, 2010, and 2014 GCs	221-44584-00	ea.	22079

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

- Includes 17A injector nut, 0.4mm 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
Siitek® Treated Injector Nut Kit for Shimadzu 17A, 2010, and 2014 GCs	kit	22331

**Capillary Nut for Shimadzu 17A, 2010, and 2014 GCs**

- Meets OEM 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 OEM 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

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

- For use with packed columns.
- Graphite composition.

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

**5mm Stainless Steel Uniliner® Liner Adaptor Fitting for Shimadzu Packed Column GCs**

Shimadzu GCs do not require a standard 1/4" Uniliner® liner adaptor because the injection port cavity will accept 5mm Uniliner® liners. This specially-designed fitting allows a Shimadzu packed column injection port to accept 0.53mm ID columns. Use a Shimadzu 5mm nut and ferrule to install the adaptor fitting into the injection port. Includes a 1/16-inch nut and 0.8mm ID graphite ferrule.

Description	qty.	cat.#
5mm Stainless Steel Uniliner® Liner Adaptor for Shimadzu Packed Column GCs (required for installing Uniliner® liners in 1/4" injection ports)	ea.	20312

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

Capillary Installation Gauge for Shimadzu 17A, 2010, & 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

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

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

**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 (0.25–0.65mm OD)
- 1/4" x 5/16" open end wrench
- 3/8" x 7/16" open end wrench
- 6mm x 7mm open end wrench
- 8mm x 10mm open end wrench
- 16mm x 17mm open end wrench
- rubber-tipped slide-lock tweezers
- scoring wafers with handles
- inlet liner removal tool
- septum puller
- mini wool puller/insert tool
- 4-inch tapered needle file
- swivel head flashlight
- mini hand drill set
- 15cm compact steel ruler
- pocket magnifier
- high temperature string (1 meter)
- pipe cleaner (12-inch)
- cotton tip swabs (pk. of 25)



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

restek
innovation!



Make clean,
square cuts!

Scoring Wafer with Handle

- Ceramic wafer is serrated on one side and straight-edged on the other to cut both fused silica and metal tubing cleanly.
- Unique, ergonomic handle is made of soft, comfortable rubber.



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



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



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

Description

Scoring Wafer with Handle

qty.

2-pk.

cat.#

23015



Ceramic Scoring Wafers

- Four straight scoring edges for cutting fused silica and four serrated edges for cutting MXT® metal capillary columns.
- Sure-grip handle included.



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



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

Description

Ceramic Scoring Wafers

qty.

5-pk.

cat.#

20116



Sapphire Scribe

- Cuts fused silica tubing.
- Produces a clean, square cut.



One quick stroke...



...and tap leaves a clean, square end.

Description

Sapphire Scribe

qty.

ea.

cat.#

20182



Shortix® Capillary GC Column Cutter

- Consistently make precise, clean, square cuts with a diamond blade.
- Built-in magnifier to verify square cut.
- Use with 0.25mm ID to 0.53mm ID tubing (0.78mm OD maximum).
- Maintenance kit includes diamond cutting wheel, O-rings, and a tool to open the column cutter.

Maintenance Kit for
Shortix® Capillary GC
Column Cutter



Description

Shortix® Capillary GC Column Cutter

qty.

ea.

cat.#

23026

Maintenance Kit for Shortix® Capillary GC Column Cutter

qty.

kit

cat.#

23027

Capillary Column Caps

- Attach to the column in seconds to form an airtight seal.
- Increase column lifetime—prevent moisture and air from entering the column during storage.
- Color-coded for identifying detector and injector ends.
- Not recommended for reuse.



Description

Capillary Column Caps

qty.

10-pk.

cat.#

21044

Flashlight with Swivel Head

- Ideal for tight spaces—like inside a GC oven.
- Uses two AA batteries (included).

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

**Septum Puller**

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



Remove septum without damaging an expensive weldment.



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



Description	qty.	cat.#
Septum Puller	ea.	20117

Stainless Steel Jet Reamers

A great tool for cleaning detector jets and other small orifices. Serrated design is optimal for removing silica deposits and other contaminants.

Description	qty.	cat.#
Stainless Steel Jet Reamers	6-piece set	20113

**Open-End Wrench Set**

High-quality $\frac{1}{4}$ " x $\frac{5}{16}$ ", $\frac{3}{8}$ " x $\frac{7}{16}$ ", $\frac{7}{16}$ " x $\frac{1}{2}$ ", and $\frac{1}{2}$ " x $\frac{9}{16}$ " wrenches for tightening a wide variety of chromatograph and other fittings.

Description	qty.	cat.#
Open-End Wrench Set	set	20387

**Open-End Wrenches**

High-quality wrenches for tightening capillary fittings.

Description	qty.	cat.#
Open-End Wrenches ($\frac{1}{4}$ " x $\frac{5}{16}$ ")	2-pk.	20110
Open-End Wrenches ($\frac{3}{8}$ " x $\frac{7}{16}$ ")	2-pk.	22455

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

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

**Pocket Magnifier**

- Small and easy to handle.
- 10X magnification makes it easy to see the column end to verify a square cut.

Description	qty.	cat.#
Pocket Magnifier	ea.	20124



Vespel® Ferrules

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



Vespel® ferrules

Graphite Ferrules

- Pre-conditioned 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, offering 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

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

*For micropacked columns.

**For 0.28mm 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 outgassing.



Reusable!

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

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

Fitting Size	Ferrule ID	qty.	Vespel®	Graphite	Vespel®/Graphite
1/16"	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



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"	0.4mm	0.25/0.28mm	5-pk.	20241
1/16"	0.5mm	0.32mm	5-pk.	20242
1/8"	0.8mm	0.45/0.53mm	5-pk.	20246



Reducing Ferrules

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

- No more ferrule fragments in the transfer line; aluminum construction—will not crack or fragment.
- No retightening required after temperature cycles—excellent for GC/MS.
- Eliminate out-gassing, 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.
- Stable to 550°C.
- Use with any 1/16" compression-type fitting.

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

*Patent pending.



Teflon® Ferrules

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

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



5mm Ferrules for Shimadzu 17A GCs

- For use with packed columns.
- Graphite composition.

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



tech tip

Choosing the Right Ferrule

Although graphite and Vespel®/graphite ferrules each have advantages and disadvantages, the choice of ferrule composition is largely a personal preference.

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®/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.



Vu2 Union™ Column Connectors



Patent pending.

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.

Restek's Vu2 Union™ connector combines the simplicity of a Press-Tight® union with the strength of a metal union. The Vu2 Union™ connector reliably couples one analytical column to another, or to a transfer line or guard column. The columns cannot unexpectedly disconnect, even at temperatures as high as 400°C.

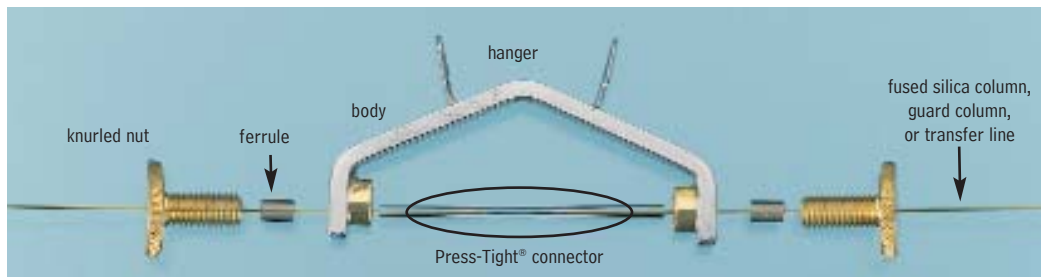
How does a Vu2 Union™ connector work?

A Press-Tight® union in the Vu2 Union™ connector joins the fused silica 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 a leak-tight seal with the column end. 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.

The Vu2 Union™ connector's open design allows visual confirmation of the seal; secondary seals ensure a leak-tight connection.



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	0.10/0.15mm	kit	22220
Vu2 Union™ Connector Kit	0.18/0.28mm	kit	21105
Vu2 Union™ Connector Kit	0.32mm	kit	21106
Vu2 Union™ Connector Kit	0.45/0.53mm	kit	21107
Knurled nut		2-pk.	21108

Universal Press-Tight® Connectors

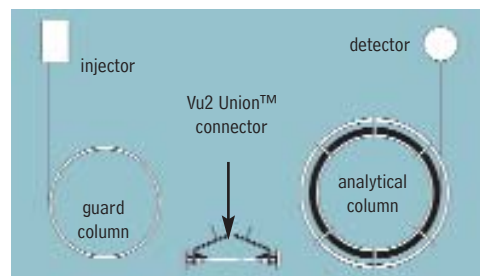
Description	5-pk.	25-pk.	100-pk.
Universal Press-Tight® Connectors	20400	20401	20402
Deactivated, Universal Press-Tight® Connectors	20429	20430	20431
Siltek® Treated Universal Press-Tight® Connectors	20480	20449	20481

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.
0.3mm	0.10/0.15mm	22221	22222
0.4mm	0.18/0.28mm	20280	20281
0.5mm	0.32mm	20282	20283
0.8mm	0.45/0.53mm	20284	20285

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



Secure, reliable
column-to-column
connections!

NOTE: Not recommended for GC column-to-MS connections—use the Vacuum Vu-Union® (see our general catalog or website).



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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.

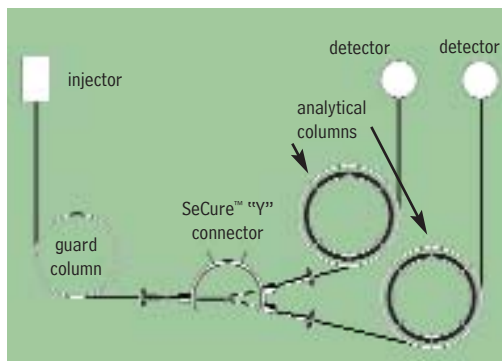
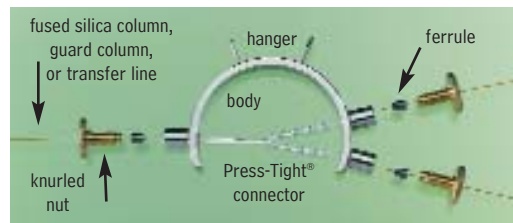
Combine the simplicity of a "Y" Press-Tight® connector with the strength of a metal union. The ferrules and knurled nuts hold the fused silica tubing in place, which prevents the tubing from unexpectedly disconnecting, even at temperatures as high as 400°C.

The SeCure™ "Y" Connector's open design allows visual confirmation of the seal; secondary seals ensure a leak-tight connection.

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



Patent pending.



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	0.18/0.25/0.28mm	kit	20276
SeCure™ "Y" Connector Kit	0.32mm	kit	20277
SeCure™ "Y" Connector Kit	0.45/0.53mm	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.
- Split a single column flow to two detectors—perform confirmation analysis with a single injection.
- Deactivated Press-Tight® connectors assure better recovery of polar and non-polar compounds.
- Siltek® treated connectors are ideal for organochlorine pesticides analysis.
- Fit column ODs from 0.33–0.74mm (Restek 0.1mm–0.53mm ID).

Description	ea.	3-pk.
Universal "Y" Press-Tight® Connector	20405	20406
Deactivated Universal "Y" Press-Tight® Connector	20405-261	20406-261
Siltek® Treated Universal "Y" Press-Tight® Connector	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.
0.4mm	0.18/0.25/0.28mm	20200	20227
0.5mm	0.32mm	20201	20228
0.8mm	0.45/0.53mm	20202	20224



HROMalytic **RESTEK** '07
Australian Distributors **ECH** nology
Tel: 03 9762 2034 Fax: 03 9761 1169 www.chromtech.net.au info@chromtech.net.au



Universal Press-Tight® Connectors

- Connect a guard column to an analytical column.
- Repair a broken column.
- Connect a column outlet to a transfer line.
- Deactivated Press-Tight® connectors assure better recovery of polar and non-polar compounds.
- Siltek® treated connectors are ideal for organochlorine pesticides analysis.
- Fit column ODs from 0.33–0.74mm (Restek 0.1mm–0.53mm ID).

Description	5-pk.	25-pk.	100-pk.
Universal Press-Tight® Connectors	20400	20401	20402
Deactivated, Universal Press-Tight® Connectors	20429	20430	20431
Siltek® Treated Universal Press-Tight® Connectors	20480	20449	20481



Universal Angled Press-Tight® Connectors

- Ideal for connecting a guard column to an analytical column.
- Made from inert fused silica.
- Angle approximates the curvature of a capillary column, reduces strain on column-end connections.
- Deactivated Press-Tight® connectors assure better recovery of polar and non-polar compounds.
- Siltek® treated connectors are ideal for organochlorine pesticides analysis.
- Fit column ODs from 0.33–0.74mm (Restek 0.1mm–0.53mm ID).

Description	5-pk.	25-pk.	100-pk.
Universal Angled Press-Tight® Connectors	20446	20447	20448
Deactivated Universal Angled Press-Tight® Connectors	20446-261	20447-261	20448-261
Siltek® Treated Universal Angled Press-Tight® Connectors	20482	20483	20484



Universal "Y" Press-Tight® Connectors

An alternative method of performing dual-column confirmational analyses!

- Split sample flow onto two columns.
- Split a single column flow to two detectors—perform confirmation analysis with a single injection.
- Deactivated Press-Tight® connectors assure better recovery of polar and non-polar compounds.
- Siltek® treated connectors are ideal for organochlorine pesticides analysis.
- Fit column ODs from 0.33–0.74mm (Restek 0.1mm–0.53mm ID).

Description	ea.	3-pk.
Universal "Y" Press-Tight® Connector	20405	20406
Deactivated Universal "Y" Press-Tight® Connector	20405-261	20406-261
Siltek® Treated Universal "Y" Press-Tight® Connector	20485	20486



Universal Angled "Y" Press-Tight® Connectors

- Perform confirmation analysis with a single injection.
- Made from inert fused silica.
- Inlet and outlet ends conform to the column curvature—alleviates column-end connection strain.
- Deactivated Press-Tight® connectors assure better recovery of polar and non-polar compounds.
- Siltek® treated connectors are ideal for organochlorine pesticides analysis.
- Fit column ODs from 0.33–0.74mm (Restek 0.1mm–0.53mm ID).

Description	ea.	3-pk.
Universal Angled "Y" Press-Tight® Connector	20403	20404
Deactivated Universal Angled "Y" Press-Tight® Connector	20403-261	20404-261
Siltek® Treated Universal Angled "Y" Press-Tight® Connector	20487	20469



Universal "X" Press-Tight® Connectors

- Connect a column to three detectors.
- Connect a column to two detectors and a sniffer port.
- Split sample flow onto three columns.
- Deactivated Press-Tight® connectors assure better recovery of polar and non-polar compounds.
- Fit column ODs from 0.33–0.74mm (Restek 0.1mm–0.53mm ID).

Description	ea.	3-pk.
Universal "X" Press-Tight® Connector	20407	20408
Deactivated Universal "X" Press-Tight® Connector	20407-261	20408-261
Siltek® Treated Universal "X" Press-Tight® Connector	20407-266	20408-266



Polyimide Resin

- Permanently 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 350°C.
- Available in union and “Y” configurations.

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 0.25mm ID Fused Silica Columns	kit	21386
For 0.32mm ID Fused Silica Columns	kit	21385
For 0.53mm 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 0.25mm ID Fused Silica Columns	kit	21389
For 0.32mm ID Fused Silica Columns	kit	21388
For 0.53mm 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

We recommend a one-piece adaptor ferrule for use in fittings in which the ferrule will not be removed. Connections are made or broken by tightening or loosening the fitting nut and sliding the tubing in or out. Fused silica adaptor ferrules are Valcon polyimide, a unique graphite-reinforced composite, specially prepared to maximize mechanical stability at temperatures to 350°C. The determining factor for selecting adaptor ferrule size is the fused silica tubing OD.

1/32-Inch Adaptor Ferrule (Valcon Polyimide)

Tubing OD	Tubing ID	Valco® #	qty.	cat. #
0.25 ≤ 0.40mm	0.25mm	FS.4-5	5-pk.	20137
0.40 ≤ 0.50mm	0.32mm	FS.5-5	5-pk.	20140
0.50 ≤ 0.80mm	0.53mm	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



Super-Clean™ Gas Filters

- High-purity output ensures 99.9999% pure gas.
- “Quick connect” fittings for easy, leak-tight cartridge changes.
- Glass inside to prevent diffusion; plastic outside for safety.

Designed for fast, simple cartridge changing

Cartridge systems make changing gas filters quick and easy, and Super-Clean™ gas filters are the latest in cartridge-style gas filtration. A baseplate allows cartridges to be exchanged without introducing oxygen. Spring-loaded check valves seal when a filter is removed and open only when a new filter has been locked in place. There is no longer a need for loosening and tightening fittings every time a trap is changed, and your system will not become contaminated during the process.

With available 2- or 3-position baseplates, you can purify all GC gas streams at one location. Figure 1 shows some possible filter cartridge combinations using these baseplates. Any combination is possible because any Restek Super-Clean™ filter cartridge can be used with any Restek baseplate.

High-purity output for improved sensitivity (Table I)

The Triple Filter cartridge (cat.# 22020) is ideal for purifying carrier gas. This trap contains oxygen, moisture, and hydrocarbon scrubbers in one cartridge. The purity of your carrier gas after flowing through the Triple Filter is better than six-9s (99.9999% pure), which is ideal for sensitive mass spectrometry (MS) or ECD analyses, and for protecting your analytical columns against damage from contaminated carrier gas.

The Fuel Gas Filter cartridge (cat.# 22022) is perfect for purifying flame ionization detector (FID) fuel gases, removing both moisture and hydrocarbons. Using the Fuel Gas Filter for FID hydrogen and air will produce a stable baseline, improving overall reproducibility and sensitivity.



did you know?

All Super-Clean™ 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.

tech tip

Oxygen and Moisture Traps

We highly recommend 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.

Figure 1 Filter cartridges can be configured for different applications.

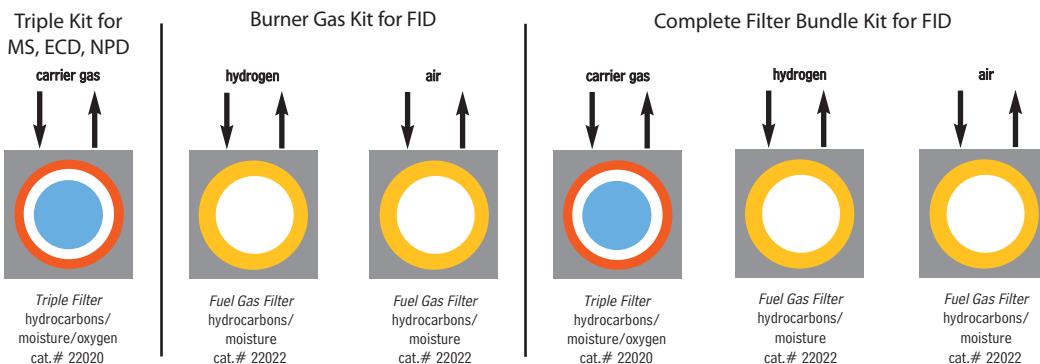


Table I Each Super-Clean™ filter provides high-purity outlet gas.

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 159psi/ 7 L/min.	Inert carrier gas Air Hydrogen	Yellow to clear	7.2	—	—	>2
Oxygen cat.# 22029	>99.9999	11 bar 159psi/ 7 L/min.	Inert carrier gas	Green to grey	NA	1000	—	>2
Hydrocarbons cat.# 22030	>99.9999	11 bar 159psi/ 7L/min.	Inert carrier gas Air Hydrogen	No indicator	NA	—	12 ¹	>2
Fuel Gas ¹ cat.# 22022	>99.9999	11 bar 159psi/ 7L/min.	Inert carrier gas Air Hydrogen	Yellow to clear	3.5	—	24 ¹	>1.5
Triple ² cat.# 22020	>99.9999	11 bar 159psi/ 7L/min.	Inert carrier gas	Yellow to clear Green to grey	1.8	500	4 ¹	>1
Helium Specific ² cat.# 21982	>99.9999	11 bar 159psi/ 7L/min.	Helium	Yellow to clear Green to grey	1.8	500	—	>1

¹Removes hydrocarbons, moisture.

²Removes hydrocarbons, moisture, oxygen.

³As *n*-butane.

Super-Clean™ Filter and Baseplate Kits

Description	qty.	cat.#
Carrier Gas Cleaning Kit (includes mounting baseplate, 1/8" inlet/outlet fittings, and oxygen/moisture/hydrocarbon Triple Filter)	kit	22019
Fuel Gas Purification Kit (includes mounting baseplate, 1/8" inlet/outlet fittings, and hydrocarbon/moisture Fuel Gas Filter)	kit	22021



All traps measure: 10⁵/₈" x 1³/₄"
(27 x 4.4 cm)
Each baseplate unit measures:
4" x 4" x 1⁷/₈"
(10.2 x 10.2 x 4.8 cm)

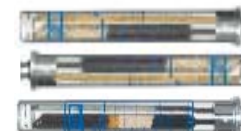
Replacement Filters

Description	qty.	cat.#
Replacement Triple Filter (removes oxygen, moisture and hydrocarbons)	ea.	22020
Replacement Fuel Gas Filter (removes moisture and hydrocarbons)	ea.	22022

**Filter Bundle Kit**

Kit includes two Fuel Gas Filters for FID fuel gases and one Triple Filter for carrier gas.

Description	qty.	cat.#
Filter Bundle Kit	kit	22031

**Super-Clean™ Ultra-High Capacity Filters**

Description	qty.	cat.#
Ultra-High Capacity Hydrocarbon Filter	ea.	22030
Ultra-High Capacity Moisture Filter	ea.	22028
Ultra-High Capacity Oxygen Filter	ea.	22029

**Helium-Specific Super-Clean™ Filter and Kit**

- Specifically designed for purification of helium in GC/MS systems.
- Traps are packed and conditioned using helium.
- Uses standard single-position baseplate.

Description	qty.	cat.#
Helium-Specific Carrier Gas Cleaning Kit (includes mounting baseplate, 1/8" inlet/outlet fittings, and oxygen/moisture/hydrocarbon Helium-Specific Filter)	kit	21983
Replacement Helium-Specific Filter (removes oxygen, moisture and hydrocarbons)	ea.	21982

**Baseplates**

Standard baseplate fittings are 1/8". To adapt to 1/4", order 1/8" to 1/4" tube-end unions (cat. # 21833, below).

Description	qty.	cat.#
Single-Position Baseplate	ea.	22025
2-Position Baseplate	ea.	22026
3-Position Baseplate	ea.	22027

**Wall Mounting Bracket**

Baseplates can be mounted by using screws and the mounting holes on the baseplate, or by using this optional wall mounting bracket.

Description	qty.	cat.#
Wall Mounting Bracket for Super-Clean™ Baseplates	ea.	21984

**Replacement O-Rings for Cartridge Baseplates**

Pack includes 10 large O-rings and 10 small O-rings.

Description	qty.	cat.#
Replacement O-Rings for Cartridge Baseplates	20-pk.	22023

**1/8-Inch to 1/4-Inch Tube-End Unions**

To adapt 1/8" Super-Clean™ baseplate fittings to 1/4", use 1/8" to 1/4" tube-end unions.

Description	qty.	cat.#
1/8" to 1/4" Tube-End Unions	5-pk.	21833



Click-On Inline Super-Clean™ Traps

- High-purity output ensures 99.9999% pure gas.
- Click-On fittings for easy, leak-tight cartridge changes; brass or stainless steel, 1/4" or 1/8".
- Helium-Specific Triple Trap is ideal for GC/MS.



Using the same features and benefits as the Super-Clean™ base-plates and filters, SGT designed an inline trap. Click-On adaptor connectors allow cartridges to be exchanged without introducing oxygen. Spring-loaded check valves seal when a filter is removed and open only when a new filter has been locked in place. There is no need for loosening and tightening fittings every time a trap is changed, and your system will not become contaminated during the process.

The Triple Trap is ideal for purifying carrier gas—it contains oxygen, moisture, and hydrocarbon scrubbers in one cartridge.

The Fuel Gas Trap is ideal for purifying flame ionization detector (FID) fuel gases, removing both moisture and hydrocarbons.

The Helium-Specific Triple Trap is ideal for purifying helium in GC/MS systems. This trap is packed and purged under helium and contains oxygen, moisture, and hydrocarbon scrubbers in one cartridge.

Trap replacement depends on the quality of the incoming gas. Use the double connector and install an indicating cartridge after a trap to indicate when the trap should be replaced.

please note

Super-Clean™ Gas Filters are recommended for purifying noncorrosive gases with low concentrations of contaminants. The maximum concentration of oxygen in the incoming gas stream for oxygen purifiers is 0.5%.

Filter Type	Gas Quality at Outlet	Maximum Pressure	Maximum Flow (L/min.)	Use For	H ₂ O (g)	Capacity O ₂ (mL)	Hydrocarbons (g)	Estimated Lifetime (years)
Moisture cat.#22467	>99.9999	11 bar 160psi	25	Inert carrier gas, helium, air, H ₂	21	NA	NA	>3
Oxygen cat.#22468	>99.9999	11 bar 160psi	25	Inert carrier gas	NA	3000	NA	>3
Hydrocarbon cat.#22466	>99.9999	11 bar 160psi	25	Inert carrier gas, helium, air, H ₂	NA	NA	36 ³	>3
Fuel Gas ¹ cat.#22465	>99.9999	11 bar 160psi	25	Inert carrier gas, helium, air, H ₂	10	NA	18 ³	>2
Triple ² cat.#22464	>99.9999	11 bar 160psi	25	Inert carrier gas	6	1000	12 ³	>2

¹Removes hydrocarbons, moisture.

²Removes hydrocarbons, moisture, oxygen.

³As *n*-butane.

Click-On Inline Super-Clean™ Traps and Connector Kits

Description	qty.	cat.#
Carrier Gas Purification Kit, 1/8" Stainless Steel		
Includes (2) 1/8" SS connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22456
Carrier Gas Purification Kit, 1/8" Brass		
Includes (2) 1/8" brass connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22457
Carrier Gas Purification Kit, 1/4" Stainless Steel		
Includes (2) 1/4" SS connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22458
Carrier Gas Purification Kit, 1/4" Brass		
Includes (2) 1/4" brass connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22459
Fuel Gas Purification Kit, 1/8" Stainless Steel		
Includes (4) 1/8" SS connectors and (2) hydrocarbon/moisture traps	kit	22460
Fuel Gas Purification Kit, 1/8" Brass		
Includes (4) 1/8" brass connectors and (2) hydrocarbon/moisture traps	kit	22461
Fuel Gas Purification Kit, 1/4" Stainless Steel		
Includes (4) 1/4" SS connectors and (2) hydrocarbon/moisture traps	kit	22462
Fuel Gas Purification Kit, 1/4" Brass		
Includes (4) 1/4" brass connectors and (2) hydrocarbon/moisture traps	kit	22463



Click-On Inline Super-Clean™ Replacement Traps

Description	qty.	cat. #
Click-On Super-Clean™ Replacement Triple Trap (removes oxygen, moisture and hydrocarbons)	ea.	22464
Click-On Super-Clean™ Replacement Fuel Gas Trap (removes moisture and hydrocarbons)	ea.	22465

**Click-On Inline Super-Clean™ Ultra-High Capacity Traps**

Description	qty.	cat. #
Ultra-High Capacity Hydrocarbon Trap	ea.	22466
Ultra-High Capacity Moisture Trap	ea.	22467
Ultra-High Capacity Oxygen Trap	ea.	22468

**Helium-Specific Click-On Inline Super-Clean™ Trap and Connector Kits**

Description	qty.	cat. #
Kits		
Helium-Specific Carrier Gas Cleaning Kit, 1/8" Stainless Steel Includes (2) 1/8" SS connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap	kit	22469
Helium-Specific Carrier Gas Cleaning Kit, 1/8" Brass Includes (2) 1/8" brass connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap	kit	22470
Helium-Specific Carrier Gas Cleaning Kit, 1/4" Stainless Steel Includes (2) 1/4" SS connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap	kit	22471
Helium-Specific Carrier Gas Cleaning Kit, 1/4" Brass Includes (2) 1/4" brass connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap	kit	22472
Replacement Trap		
Helium-Specific Replacement Triple Trap (removes oxygen, moisture and hydrocarbons)	ea.	22473

did you know?

Helium-Specific Click-On Inline Super-Clean™ Trap and Kits are designed specifically for purification of helium in GC/MS systems!

**tech tip**

Install an indicator after the Click-On inline filter so there is no confusion about when to replace the traps.

Click-On Inline Super-Clean™ Indicator

- Oxygen: Green to Grey
- Moisture: Beige to Clear

Description	qty.	cat. #
Click-On Inline Super-Clean™ Indicator (oxygen, moisture)	ea.	22474

**Click-On Inline Super-Clean™ Connectors**

- Click-On connectors allow you to change traps quickly, without introducing oxygen into your system.

Description	qty.	cat. #
1/8" Brass Click-On Inline Super-Clean™ Connectors	2-pk.	22475
1/8" Stainless Steel Click-On Inline Super-Clean™ Connectors	2-pk.	22476
1/4" Brass Click-On Inline Super-Clean™ Connectors	2-pk.	22477
1/4" Stainless Steel Click-On Inline Super-Clean™ Connectors	2-pk.	22478

**Click-On Inline Super-Clean™ Double Connector**

- Connects any Click-On trap to a Click-On indicator.

Description	qty.	cat. #
Click-On Inline Super-Clean™ Double Connector, stainless steel	ea.	22479

**Wall-Mounting Clamps for Click-On Inline Super-Clean™ Traps**

Description	qty.	cat. #
Wall-Mounting Clamps for Click-On Inline Super-Clean™ Traps	4-pk.	22480

**Replacement O-Rings for Click-On Inline Super-Clean™ Connectors**

- Pack includes 10 large O-rings and 10 Small O-rings.

Description	qty.	cat. #
Replacement O-Rings for Click-On Inline Super-Clean™ Connectors	20-pk.	22481



Gas Purifiers / Traps



Dimensions: 21" x 1 1/2"
(53.3 x 3.8 cm)

Please Note: We recommend using an indicating oxygen trap (e.g., cat.# 22029, pg. 19) downstream from a VICI® Mat/Sen® purifier to continually ensure gas purity and indicate absolute change-out time.

VICI® Mat/Sen® Gas-Specific Purifier Modules

- Replace separate oxygen, moisture, and hydrocarbon traps with one multiple-bed purifier, specific for purifying helium, hydrogen, nitrogen, or air.
- Reduce gas impurities from ppm to low ppb levels.
- Decrease baseline noise and increase GC/MS sensitivity.
- Pre-purged with the specified gas, to shorten downtime.

These gas-specific purifier modules offer dramatic reductions in contaminant levels—from ppm to levels that are below the limit of standard analytical detection. Performance is optimized by incorporating a multiple-bed format that progressively lowers concentrations of contaminants at each successive bed. VICI® Mat/Sen® purifiers are guaranteed to produce gases that are purer than 99.9999%, when supplied with gas of 99.995% purity, and are pre-purged with the specified gas to speed conditioning. Purifier capacity is approximately four tanks of gas at 99.995% (50ppm) purity, and correspondingly longer for purer gases.

Specifications:

Length:	21" (52.3cm)
Diameter:	1.5" (3.8cm)
Maximum Inlet Pressure:	1000psi (6895 kPa)
Maximum Recommended Flow:	500mL/min.

Pressure Drop from 120psi (827 kPa) inlet at a flow of 0-500mL/min.:	<0.20psi (2.1kPa)
Compression End Fittings:	1/8" or 1/4", stainless steel
Shipping Weight:	3.04 lb. (1300 g)

it's a fact

The nitrogen module is excellent for LC/MS systems.

Gas-Specific Purifier Module

	qty.	1/4-inch Compression Tube Fittings		1/8-inch
		cat.#	qty.	cat.#
Helium Purifier Module	ea.	22600	ea.	22601
Hydrogen Purifier Module	ea.	22602	ea.	22603
Nitrogen Purifier Module*	ea.	22604	ea.	22605
Air Purifier Module	ea.	22606	ea.	22607

*Warning: Do not use with nitrogen containing more than 500ppm of oxygen. If the oxygen level in the stream exceeds 500ppm, use an air purifier.



Dimensions: 10" x 1 1/4"
(25.4 x 3.2 cm)

Indicating Oxygen Trap

- Indicator changes color from light green to grey as oxygen is trapped.
- Heavy-walled glass body prevents oxygen & water infusion.
- Pre-purged for fast stabilization.
- 100psig maximum operating pressure.
- Reduces oxygen to 0.1ppm.

Description	qty.	cat.#
Indicating Oxygen Trap, 1/8" Fittings	ea.	22010
Indicating Oxygen Trap, 1/4" Fittings	ea.	22011



Dimensions: 11" x 1 1/2"
(27.9 x 3.8 cm)

GC/MS Compatible

High-Capacity Oxygen Trap

- Removes up to 600mg of oxygen or 2g of water.
- Long life—typically purifies more than five 200ft³ cylinders.
- Reduces oxygen to 15ppb.
- Maximum operating pressure: 250psi.
- Flow: 3L/min. @ 32psi.

Description	qty.	cat.#
High-Capacity Oxygen Trap, 1/8" Fittings	ea.	20601
High-Capacity Oxygen Trap, 1/4" Fittings	ea.	20600



Dimensions: 11" x 1 1/2"
(27.9 x 3.8 cm)

High-Capacity Moisture Trap

- Purged with ultra-high-purity helium; ready to use.
- Reduces water to less than 15ppb.
- Maximum operating pressure: 250psi.
- Maximum flow: 1.25L/min.

Description	qty.	cat.#
High-Capacity Moisture Trap, 1/8" Fittings	ea.	21997
High-Capacity Moisture Trap, 1/4" Fittings	ea.	20638

Indicating Moisture Trap

- Reduces water to less than 10ppb; indicator changes color from blue to pink at 5% relative humidity.
- Pre-purged for fast stabilization.
- Reduces noise from high-sensitivity detectors.
- Heavy-walled glass body prevents oxygen & water infusion.
- 40µm frit prevents microparticulate damage to needle valves and flow controllers.
- Maximum operating pressure: 100psig.

Description	qty.	cat.#
Indicating Moisture Trap, 1/8" Fittings	ea.	22014
Indicating Moisture Trap, 1/4" Fittings	ea.	22015

Capillary-Grade Hydrocarbon Trap

- Packed with an extremely high surface area, baked coconut shell-based activated carbon.
- Purged with ultra-high-purity helium.
- Reduces organics to 0.1ppm (assuming 100ppm input).
- Maximum operating pressure: 250psi.

Description	qty.	cat.#
Capillary-Grade Hydrocarbon Trap, 1/8" Fittings	ea.	21991
Capillary-Grade Hydrocarbon Trap, 1/4" Fittings	ea.	21992



Dimensions: 13" x 2"
(33 x 5.1 cm)



Dimensions: 11" x 1 1/2"
(27.9 x 3.8 cm)

Model FID-1000 and FID-2500 Gas Stations

- Single unit produces UHP zero air from house compressed air and 99.9995% pure hydrogen from deionized water.
- Ideal for supplying up to 5 - 6 FIDs.
- Eliminates inconvenient and dangerous cylinders.
- Silent operation, minimal operator attention required.

Parker Balston's Gas Stations provide both UHP grade hydrogen fuel gas and zero grade air for flame ionization detectors on gas chromatographs. The system is specifically designed to supply fuel gas to FIDs and to support flame thermionic and flame photometric detectors. The units produce zero air by purifying compressed air to a total hydrocarbon concentration of 0.1ppm or less (measured as methane).

The hydrogen generators produce hydrogen gas from deionized water, using the principle of electrolytic dissociation of water and hydrogen proton conduction through a proton exchange membrane cell.

Specifications

Hydrogen Purity:	99.9995%
Zero Air Purity:	FID-1000: < 0.1ppm total hydrocarbons as methane FID-2500: < 0.05ppm total hydrocarbons as methane
Max. Hydrogen Flow Rate:	FID-1000: 90cc/min. FID-2500: 250cc/min.
Max. Zero Air Flow Rate:	FID-1000: 1000cc/min. FID-2500: 2500cc/min.
Power:	120VAC/amp, 60Hz, 400 watts
Hydrogen Outlet Pressure:	60 psig
Zero Air Outlet Pressure:	40-125 psig*
Inlet Connection:	1/4" NPT (female)
Outlet:	1/8" compression
Dimensions:	16.5"h x 10.5"w x 17"d (42cm x 27cm x 43cm)
Weight:	53 lbs. (24kg)

Description	qty.	cat.#
Model FID-1000 Gas Station (ideal for 1 - 2 FIDs)	ea.	20177
Model FID-2500 Gas Station (ideal for 5 - 6 FIDs)	ea.	24913
Replacement Components for FID Gas Stations		
Resin Bed Cartridge for Hydrogen Generators in FID-1000 and FID-2500 Gas Stations	ea.	24914
Replacement Desiccant Cartridge	ea.	21671
FID Gas Station Maintenance Kit (Includes 1 desiccant cartridge, 1 resin bed cartridge, 1 filter cartridge)	ea.	24915

*Zero air inlet requires minimum of 40psig compressed air pressure.

International Power Cord Sets

Just add the proper suffix to the catalog number for the gas generator you are ordering.

Location	qty.	cat.# suffix
United Kingdom (230VAC, 50/50Hz)	ea.	-550
European (230VAC, 50/60Hz)	ea.	-551
IEC Connector Only (230VAC, 50/60Hz)	ea.	-552
Japanese (200VAC, 50/60Hz)	ea.	-556
Japanese for Zero Air (100VAC, 50/60Hz)	ea.	-553
Japanese for Hydrogen (100VAC, 50/60Hz)	ea.	-554
Japanese for Nitrogen (100VAC, 50/60Hz)	ea.	-555



CE

Produce zero air and pure hydrogen from one unit!

free literature

For more information, download a free copy of our *FID Gas Stations Fast Facts* from www.restek.com

lit. cat.# 580051



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

- Oxidation-resistant, chrome-plated.
- Most stable outlet pressure control throughout the life of a high-pressure gas cylinder.
- Secondary pressure regulation not needed.
- Most widely used regulator.
- Less internal volume than stainless steel regulators.

Outlet pressure: 0 to 100psig
 Outlet gauge: 30" – 0 to 200psig
 Inlet gauge: 0 to 4000psig
 Outlet assembly: diaphragm valve, 1/4" tube fitting

Fitting	qty.	cat.#
CGA 580 (N ₂ , He, Ar)	ea.	21667
CGA 350 (H ₂ , P ₂)	ea.	21668
CGA 590 (Air)	ea.	21669

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

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

Outlet pressure: 0 to 100psig
 Outlet gauge: 30" – 0 to 200psig
 Inlet gauge: 0 to 4000psig
 Outlet assembly: diaphragm valve, 1/4" tube fitting

Fitting	qty.	cat.#
CGA 580 (N ₂ , He, Ar)	ea.	20646
CGA 350 (H ₂ , P ₂)	ea.	20647
CGA 590 (Air)	ea.	20648



Instrument-Grade Welded and Drawn 304 Grade Stainless Steel Tubing

Clean tubing is critical to the delivery of pure gas to your instrument. Restek's Stainless Steel Tubing is specially cleaned for inertness by using the procedure for processing our Silcosteel® and Siltek®-treated products, because scrupulously clean parts are a prerequisite for a quality coating.

cleaned

All tubing is cleaned and ready to use.

ordering note

Required length in meters
 x 3.2808 = length in feet.

An extra charge is applied for cutting and/or straightening stainless steel and/or copper tubing, calculated from the total number of pieces produced for each line item:

# of Pieces	Added Charge
5 to 15	\$50
16 to 30	\$100
31 to 75	\$150
76 to 99	\$200
100 to 200	\$250

Tubing Dimensions		25 Feet	Length (per-foot pricing on 26 feet or more)	
ID (in.)	OD (in.)	cat.#	26–100 Feet	> 100 Feet*
0.01" ID	1/32" OD	21500	21501	21502
0.02" ID	1/32" OD	21503	21504	21505
0.03" ID	1/32" OD	21506	21507	21508
0.04" ID	1/32" OD	21509	21510	21511
0.085" ID	1/8" OD	21512	21513	21514
0.21" ID	1/4" OD	21515	21516	21517

*The availability of long lengths (continuous lengths up to 500 feet) is subject to inventory constraints. Please inquire before ordering.

Cleaned Copper Tubing

- Adheres to ASTM B-280.
- Precleaned and ready to use.
- Use for plumbing GC systems.

ID	OD	Wall	qty.	cat.#
0.065"	1/8"	0.030"	50 ft.	21590
0.190"	1/4"	0.030"	50 ft.	21592

GC Installation Kit

This kit contains the tubing and fittings needed to add an additional GC to your lab bench. Also included are four 1/8-inch tees, so carrier, fuel, and other GC gases can be routed to the new inlet or detector from existing gas lines. Order additional parts, such as purifiers or regulators, separately to customize the GC installation to your specifications. Kit includes: one tubing cutter, one 1/8-inch x 1/4-inch reamer, one 7/16-inch wrench, one 1/2-inch wrench, four 1/8-inch brass tees, ten 1/8-inch brass nuts, ten brass front and back ferrules, and 50 feet (15.2 meters) of our instrument-grade cleaned 1/8-inch copper tubing.



Description	qty.	cat.#
GC Installation Kit	kit	21325

1/16-Inch Tubing Cutter

- Produces square, smooth cuts in 1/16-inch tubing.
- Eliminates tubing distortion.
- Replaceable cutting wheel.



Description	qty.	cat.#
1/16" Tubing Cutter	ea.	20192
Replacement Cutting Wheels	3-pk.	20185

Ridgid® Tubing Cutter

- Excellent for cutting 1/8- or 1/4-inch metal tubing.
- Compact size is ideal for tight spaces.
- Replaceable cutting wheel.



Description	qty.	cat.#
Ridgid® Tubing Cutter for 1/8" or 1/4" metal tubing	ea.	23011
Replacement Cutting Wheels	2-pk.	23012

Tubing Reamer

- Removes burrs from stainless steel tubing.
- For 1/4- or 1/8-inch tubing.
- Non-slip safety design.



Description	qty.	cat.#
Tubing Reamer	ea.	20134

Tubing Dressing Tool

Same tool as included with the SSI tube cutting machine.

Description	qty.	cat.#
1/16" Tubing Dressing Tool	ea.	20188
Replacement Insert for 1/16" Tubing Dressing Tool	ea.	20189
1/8" Tubing Dressing Tool	ea.	20190
Replacement Insert for 1/8" Tubing Dressing Tool	ea.	20191

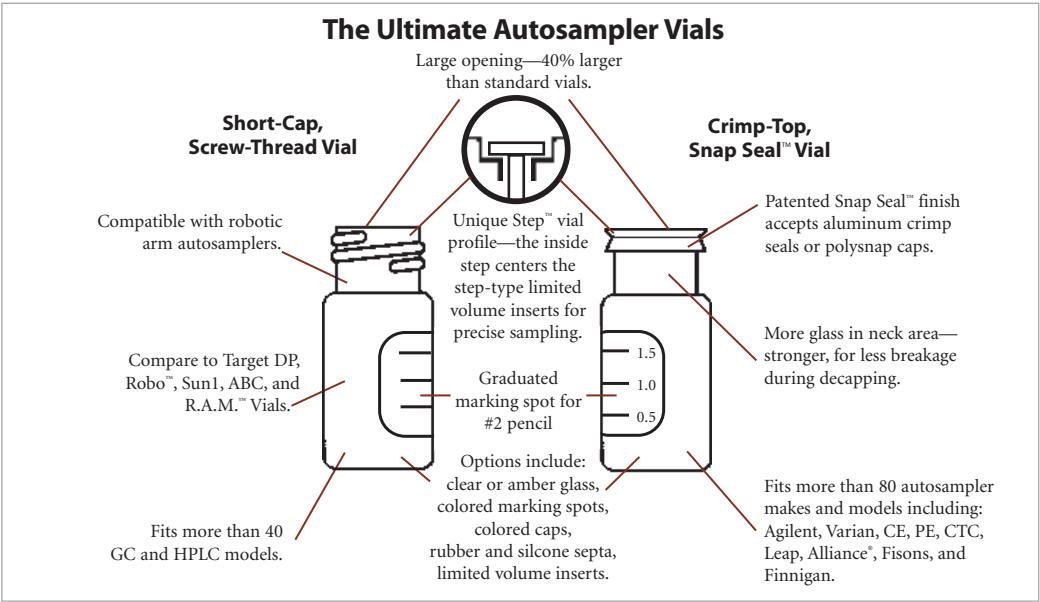


1/16-Inch Tubing Cutting Pliers

- Ideal for cutting 1/16-inch tubing.
- Cuts quickly, reducing distortion.
- Cuts clean, eliminating need for deburring.



Description	qty.	cat.#
1/16" Tubing Cutting Pliers	ea.	20193



For a highly inert surface, we recommend Siltek® deactivation for your vials:

- Maximizes inertness, minimizes sample breakdown—ideal for difficult matrices and reactive compounds.
- Inert over a wide sample pH range.
- Low bleed.
- Thermally stable.

Our proprietary Siltek® deactivation process (US patent # 6,444,326) produces a highly inert glass surface that features high temperature stability, extreme durability, and low bleed. Try Siltek® deactivated vials for better recovery of sample analytes.

For Siltek® vials, add the corresponding suffix number to the vial catalog number.

Qty.	Siltek® Deactivation	
100-pk.	-222	addl. cost
1000-pk.	-223	addl. cost

instrument **reference**

Shimadzu Instrument Model #	11mm Crimp-Top	9mm Short-Cap, Screw-Thread	Headspace	8mm Screw-Thread	10mm Screw-Thread	WISP™ 48 Style
SIL-10A, 10Ai, 10AxL	X	X		X	X	
AOC-8B/9, SIL-6A, SIL-6B, -9A, -8A				X		
AOC-14/1400, AOC-17				X		X
SIL-2AS						X
HSS-2B			X			



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

White graduated marking spots are a standard feature unless otherwise noted.

**Crimp-Top Vials, Snap Seal™ Style—12 x 32mm, 11mm Crimp**

Description	100-pk.	1000-pk.
2.0mL Clear Glass Vial w/White Graduated Marking Spot	24383	24384
2.0mL Amber Glass Vial w/White Graduated Marking Spot	24385	24386
2.0mL Clear Glass Vial without Graduated Marking Spot	21152	21153

11mm Aluminum Crimp Seals with Septa

Description	100-pk.	500-pk.	1000-pk.
Silver Seal, PTFE/Natural Rubber Septa	21174	—	21175
Blue Seal, PTFE/Red Rubber Septa	24351	—	24352
Green Seal, PTFE/Red Rubber Septa	24353	—	24354
Red Seal, PTFE/Red Rubber Septa	24355	—	24356
Yellow Seal, PTFE/Red Rubber Septa	24357	—	24358
Mixed Colors, PTFE/Rubber Septa	—	21724	—
Silver Seal, PTFE/Silicone Septa	24359	—	24360
Blue Seal, PTFE/Silicone Septa	24361	—	24362
Green Seal, PTFE/Silicone Septa	24363	—	24364
Red Seal, PTFE/Silicone Septa	24365	—	24366
Yellow Seal, PTFE/Silicone Septa	24367	—	24368
Mixed Colors, PTFE/Silicone Septa	—	21725	—
Silver Seal, PTFE/Silicone/PTFE Septa	24369	—	24370

for **more** infosee **page 31** for new electronic crimpers and decappers.**Convenience Kits: Vials, Caps, & Septa**

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

Description	100-pk.	1000-pk.
2.0mL Clear Vial, deactivated , PTFE/Natural Rubber Silver Seal	24671	24672
2.0mL Amber Vial, deactivated , PTFE/Natural Rubber Silver Seal	24673	24674
2.0mL Clear Vial, untreated, PTFE/Natural Rubber Silver Seal	21196	21197
2.0mL Amber Vial, untreated, PTFE/Natural Rubber Silver Seal	21198	21199
2.0mL Clear Vial, untreated, PTFE/Silicone Silver Seal	24646	24647
2.0mL Amber Vial, untreated, PTFE/Silicone Silver Seal	24648	24649

**Limited Volume Inserts for 2mL Crimp-Top & Short-Cap, Screw-Thread Vials**

Description	100-pk.	1000-pk.
50µL Glass, Big Mouth, Bottom Spring	24513	21782
250µL Glass, Big Mouth Insert w/ Bottom Spring	21776	21777
250µL Glass, Big Mouth Insert w/ Glass Flange (Step™ Design)*	24516	21779
350µL Glass, Flat Bottom Insert	21780	24517
350µL Glass, Flat Bottom Insert w/ ID Ring	24692	24693
250µL Polypropylene, Big Mouth, Bottom Spring	24518	—
250µL Polypropylene, Big Mouth, Top Flange	24519	—
250µL Polypropylene, Big Mouth, No Spring	24520	—

*Not to be used with 9mm screw-thread vials.

**Limited Volume Vials, 11mm Crimp-Top**

Description	100-pk.	1000-pk.
100µL Polypropylene	24651	24652
100µL Glass Insert/Clear Plastic Vial	24653	—

**instrument **reference******For 11mm Crimp-Top Vials**

Manufacturer	Instrument/Model #
Shimadzu	SIL-10A, 10Ai, 10AxL

8mm Screw-Thread Vials



8mm (2.0mL)
Screw-Thread Vial

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

Fit all 2.0mL, 12 x 32mm, Screw-Thread Vial-Based Autosamplers.

These vials provide the most secure environment for your sample, because evaporation is minimized. We offer both deactivated (on request) and non-deactivated vials.

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

Description	100-pk.	1000-pk.
2.0mL Clear Vial, White Graduated Marking Spot	24619	24620
2.0mL Amber Vial, White Graduated Marking Spot	24621	24622

8mm Pre-Assembled Caps and Septa

Description	100-pk.	1000-pk.
8/425 Black Cap w/ Red PTFE/Silicone Septa, 0.065"	21149	21720
8/425 Black Top Hat™ PTFE/Silicone Septa	21721	21722

Pre-Assembled Vial Kits: 8mm/425 Screw-Thread, Unmarked Vials, Septa, and Caps

Caps attached to vials.

Description	100-pk.	1000-pk.
Clear Vial, Black Cap, Red PTFE/Silicone Septa, 0.045"*	24630	24631
Amber Vial, Black Cap, Red PTFE/Silicone Septa, 0.045"*	24632	24633
Clear Vial, Black Cap, Red PTFE/Silicone Septa, 0.065"	24634	24635
Amber Vial, Black Cap, Red PTFE/Silicone Septa, 0.065"	24636	24637

*Best fit for Shimadzu.

Convenience Kits: Vials w/Pre-Assembled Caps and Septa Packed Separately

(Black Polypropylene Open-Hole Caps and 8mm Red PTFE/Silicone Septa, 0.065")

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

Description	100-pk.	1000-pk.
2.0mL Clear Vial, Silcote™ CL7-Deactivated	24638	24639
2.0mL Amber Vial, Silcote™ CL7-Deactivated	24640	24641
2.0mL Clear Vial, untreated	21192	21193
2.0mL Amber Vial, untreated	21194	21195



8mm/425 Thread Polypropylene Caps for 8mm Screw-Thread Vials

Description	100-pk.	1000-pk.
Black, Open-Hole Cap	21176	21177

Septa for 8mm Screw-Thread Vials

Description	100-pk.	1000-pk.
8mm x 0.045" Red PTFE/Silicone	21178	21179
8mm x 0.065" Red PTFE/White Silicone	21795	21147

Limited Volume Inserts for 8mm/425 Screw-Thread Vials

Description	100-pk.	1000-pk.
100µL Glass w/ Polypropylene Bottom Spring	24508	21775
250µL Glass, Flat Bottom	—	24510
250µL Glass, Flat Bottom w/ ID Ring	—	24691
100µL Polypropylene, No Spring	24511	—
100µL Polypropylene, Bottom Spring	24512	—

Limited Volume Vials, 12 x 32mm, 8mm/425 Thread

Description	100-pk.	1000-pk.
100µL Polypropylene	24623	24624
100µL Glass Insert/Clear Plastic Vial*	24625	—

*Amber glass/clear plastic available on request (1000 packs only).



Flat Bottom Limited
Volume Insert w/ ID Ring

instrument reference

For 8mm Screw-Thread Vials

Manufacturer	Instrument/Model #
Shimadzu	AOC-8B/9, SIL-6A, AOC14/1400, AOC-17, SIL-6B, -9A, -8A, SIL-10A, 10Ai, 10AxL

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

Fit all 2.0mL, 12 x 32mm, Crimp-Top Vial Based Autosamplers.

- Shorter screw cap allows the robotic autosampler to function properly.
- Wider opening prevents syringe problems.
- Dimensions are effectively identical to the crimp-top vial.
- Variety of colors and liner material.

Are you tired of dealing with crimp-top vials, but worried about using screw-thread vials with your autosampler? If you want the performance of a crimp-top vial with the convenience of a screw-thread vial, these vials are the answer for you.

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

Description	100-pk.	1000-pk.
2.0mL Clear Vial, w/White Graduated Marking Spot	21140	21141
2.0mL Amber Vial, w/White Graduated Marking Spot	21142	21143
2.0mL Clear Vial, without Graduated Marking Spot	21154	21155

9mm Thread Pre-Assembled Short-Cap, Screw-Vial Closures

Description	100-pk.	500-pk.	1000-pk.
Blue Cap, PTFE/Red Rubber Liner	24473	—	24474
Mixed Colors, PTFE/Red Rubber Liner	—	24668	—
Blue Cap, PTFE/Silicone Liner	24485	—	24486
Green Cap, PTFE/Silicone Liner	24487	—	24488
Yellow Cap, PTFE/Silicone Liner	24493	—	24494
Mixed Colors, PTFE/Silicone Liner	—	24669	—
Blue Cap, PTFE/Silicone/PTFE Liner	24497	—	24498
Black Cap, PTFE/Silicone/PTFE Liner	24495	—	24496
Mixed Colors, PTFE/Silicone/PTFE Liner Cap	—	24670	—



Ideal for autosamplers that process 12 x 32mm crimp-top vials.

instrument reference

For 9mm Short-Cap, Screw-Thread Vials

Manufacturer	Instrument/Model #
Shimadzu	SIL-10A, 10Ai, 10Axi

Screw-Thread Vials, 12 x 32mm, 10mm/425 Thread, Big Mouth Step™ Design

- 40% larger opening than other vials.
- Step™ profile automatically centers glass flange limited volume inserts.
- Pre-assembled caps with septa, with or without vials.
- Designed for Waters Alliance® autosamplers.

The Big Mouth Step™ Vial System has a larger ID than conventional vials and incorporates a neck finish that is uniquely designed to allow the insert to be precisely aligned in the center of the vial. This precise alignment provides maximum sample withdrawal and eliminates any chance of missed injections. All vials with the large opening are designed with the Step™ Vial System.

Big Mouth Step™ Screw-Thread Vials (12 x 32mm, 10mm/425 Thread)

Description	100-pk.	1000-pk.
2.0mL Clear Step™ Vial, White Graduated Marking Spot	24626	24627
2.0mL Amber Step™ Vial, White Graduated Marking Spot	24628	24629



10mm Pre-Assembled Big Mouth Step™ Vial Kits (w/Black Cap)

Caps attached to vials.

Description	100-pk.	1000-pk.
2.0mL Clear Vial, PTFE/Silicone/Red PTFE Septa, 0.040"	24675	24676
2.0mL Clear Vial, Red PTFE/Silicone Septa, 0.065"	24642	24643
2.0mL Amber Vial, Red PTFE/Silicone Septa, 0.065"	24644	24645

instrument reference

For 10mm Screw-Thread Vials

Manufacturer	Instrument/Model #
Shimadzu	SIL-10A, 10Ai, 10Axi



4.0mL Clear Step™ Vial

Screw-Thread Step™ Vials, 4.0mL, WISP™ 48 Style, 13mm/425 Screw-Thread**WISP™ 48 Screw-Thread Step™ Vials (15 x 45mm, 13/425 Screw-Thread)**

Description	100-pk.	1000-pk.
4.0mL Clear Step™ Vial, White Grad. Marking Spot	24654	24655
4.0mL Amber Step™ Vial, White Grad. Marking Spot	24656	24657

Caps and Septa

Description	100-pk.	1000-pk.
Top Hat™, PTFE/Silicone Septa	21745	21746
Pre-Assembled, Red PTFE/Silicone, 0.065"	21743	21744
Caps, Black, Polypropylene, Open-Hole	21741	21742
Septa, Red PTFE/Silicone, 0.040"	21751	21752
Septa, Red PTFE/Silicone, 0.060"	21749	21750

Limited Volume Inserts

Description	100-pk.	1000-pk.
500µL, Glass, WISP™, Flat Bottom*	21787	21788

*Also fit 4.0mL Snap Seal™ Vials (see our general catalog or website).

instrument reference**For WISP™ 48 Style Vials**

Shimadzu AOC-14/1400, AOC-17, SIL-2AS

Manufacturer	Instrument/Model #
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**Headspace Vials****Headspace Autosampler Vials**

Description	100-pk.	1000-pk.
2mL Clear Vial	21160	21161

For Headspace Vials

Manufacturer	Instrument/Model #
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Shimadzu HSS-2B

20mm Aluminum Seals w/Septa, Assembled

Description	100-pk.	1000-pk.
Silver Seal w/ PTFE/Gray Butyl Rubber	21761	21762
Silver Seal w/ PTFE/Silicone	21763	21764
Pressure Release Silver Seal w/ PTFE/Gray Butyl Rubber Septum	21765	21766
Pressure Release Silver Seal w/ PTFE/Silicone Septum	21767	21768
20mm Magnetic Crimp Cap w/Teflon®/Silicone Septum (tan/white) with 8mm Hole	22831	22832
20mm Magnetic Crimp Cap w/Teflon®/Silicone Septum (tan/white) with 5mm Hole	22833	22834
20mm Magnetic Crimp Cap w/PTFE/Butyl Septum with 8mm Hole	22835	22836
20mm Magnetic Crimp Cap w/PTFE/Butyl Septum with 5mm Hole	22837	22838

5mm hole is compatible with the following systems: Carlo Erba HS500/HS800, CTC 500, Fisons HS500/HS800 and Varian/Chrompack 9020/25. 8mm hole is compatible with the Combi Pal.



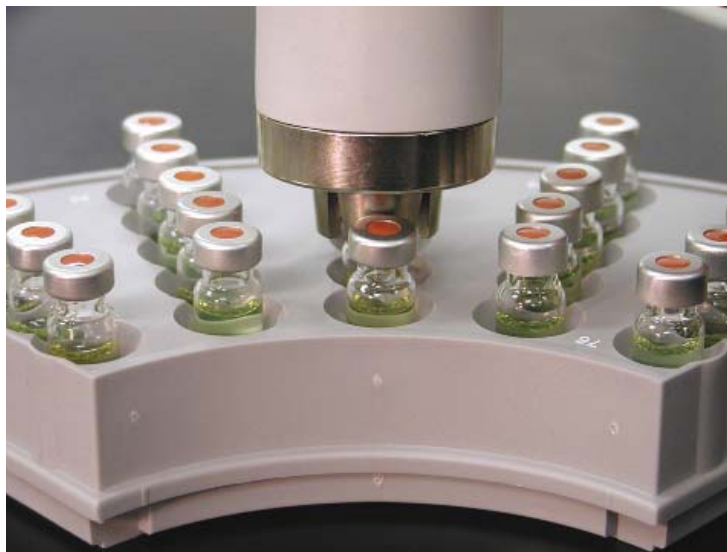
Hand-held Rechargeable Crimpers and Rechargeable Decappers

- Easy to use; comfortable grip.
- Hundreds of operations from one charge.
- Adjustable crimping force.
- All kits include battery charger.

Powered by a standard Black and Decker Versapak® battery, these electronic tools for 11mm or 20mm caps will cycle hundreds of times on a single charge. The cycle is controlled precisely, through an internal counter, and is adjusted with two buttons on the side of the case. The tools fit comfortably in the hand and weigh approximately 600 grams. The jaws can be positioned easily around closely-spaced vials in standard autosampler trays. Each kit includes the tool, a Versapak® Gold rechargeable battery, which uses environmentally friendly NiMH technology, and a charger. Recharging generally takes 6-9 hours.



The Electronic Crimper fits around vials in standard autosampler trays. The adjustable setting provides a precision crimp, vial after vial.

**Decapping has never been easier!**

one. . .



two. . .



three!



Description	qty.	cat.#
11mm Electronic Crimper (110 volt battery charger)	kit	22853
11mm Electronic Crimper (220 volt European battery charger)	kit	22853-EUR
11mm Electronic Crimper (220 volt UK battery charger)	kit	22853-UK
11mm Electronic Decapper (110 volt battery charger)	kit	22854
11mm Electronic Decapper (220 volt European battery charger)	kit	22854-EUR
11mm Electronic Decapper (220 volt UK battery charger)	kit	22854-UK
20mm Electronic Crimper (110 volt battery charger)	kit	22851
20mm Electronic Crimper (220 volt European battery charger)	kit	22851-EUR
20mm Electronic Crimper (220 volt UK battery charger)	kit	22851-UK
20mm Electronic Decapper (110 volt battery charger)	kit	22852
20mm Electronic Decapper (220 volt European battery charger)	kit	22852-EUR
20mm Electronic Decapper (220 volt UK battery charger)	kit	22852-UK



Syringe Overview

did you know?

Syringes and needles manufactured by Hamilton Company and SGE are intended for scientific research and laboratory use only and are not intended for human *in vivo* use.

Restek offers complementing lines of syringes from Hamilton & SGE.

- Hamilton: The historical leader in precision fluid measuring devices for more than 50 years, with a commitment to precision, quality, and accuracy.
- SGE: More than 35 years of providing a comprehensive range of analytical syringes unsurpassed in design, quality, and performance.

Needle Gauge Chart

Gauge	Nominal OD		Nominal ID	
26s	0.019 in.	0.47mm	0.0050 in.	0.13mm
26	0.018 in.	0.46mm	0.0102 in.	0.26mm
25	0.021 in.	0.51mm	0.0102 in.	0.26mm
23s	0.025 in.	0.64mm	0.0060 in.	0.15mm
23	0.025 in.	0.64mm	0.0132 in.	0.34mm
22s	0.028 in.	0.72mm	0.0060 in.	0.15mm
22	0.028 in.	0.72mm	0.0162 in.	0.41mm

Needle Point Style

Restek offers several different point styles on syringe and needle products. Choose one depending on your application.



Point Style 2, BV: beveled needle tip. Recommended for optimum septum penetration and prevention of septum coring.



Point Style 3, LC: square/blunt needle tip. For use with HPLC injection valves and for sample pipetting.



Point Style 5: conical needle with side hole. Liquid samples are filled and dispensed through the side hole.



Point Style H: domed needle tip with a side hole. Liquid samples are filled and dispensed through the side hole. The solid tip minimizes septum damage.



Point Style Agilent/Cone: Special conical style needle point used exclusively on syringes for autosamplers.

Syringe Termination

From cemented to removable needles and from Teflon® luer-lock to special syringe fittings, syringe barrel terminations create the interface between a syringe and its mating connection. For your reference, we have listed the Hamilton/SGE designations for the most common terminations below.



N, Cemented Needle / F, Fixed:

Needle cemented into the glass syringe barrel at a point corresponding to the zero graduation mark. Not autoclavable.



KH, Knurled Hub / R, Removable:

Used on 7000 Series Hamilton syringes, exclusively. Knurled hub enables 6000 psig maximum injection pressures and the attachment of a spacer for repeatable-depth injections. Autoclavable when disassembled.



RN, Removable Needle / R, Removable:

Needle seats precisely to the zero graduation mark of the syringe. Allows the use of different specification needles on the same syringe barrel. Autoclavable when



TLL, Teflon® Luer-Lock / LL, Luer Lock / LT, Luer Tip:

Male luer taper with nickel-plated brass hub accepts and locks into place luer hub needles and connectors. Autoclavable when disassembled.

Autosampler Syringes for Shimadzu GCs

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



Hamilton 10µL Autosampler Syringe

Hamilton Syringes for Shimadzu AOC 9 GCs

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



SGE 5µL Autosampler Syringe

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

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

*Gas-Tight

Guide to Needle Termination Codes**Hamilton:**

(N) Cemented Needle
 (RN) Removable Needle
 (ASN) Autosampler Cemented Needle
 (ASRN) Autosampler Removable Needle
 (TLL) Teflon® Luer Lock
 (KH) Knurled Hub
 (LT) Luer Tip
 (LTN) Luer Tip Cemented Needle

SGE:

(F) Fixed Needle
 (R) Removable Needle
 (LL) Luer Lock
 (LT) Luer Tip

Replacement Needles for Shimadzu Autosampler Syringes**Needles for SGE Syringes**

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

Standard Microliter Volume Syringes

Standard Microliter Volume Syringes

- Economical.
- Available with cemented needles (N/F) or removable needles (RN/R).
- Each syringe plunger and barrel assembly is manufactured as one working unit; components are not interchangeable or individually replaceable.



Hamilton 700 Series Microliter Syringe

Hamilton Syringes

Volume	Needle Term.	Needle Gauge	Needle Length	Point Style	Hamilton		qty.	Restek
					Model	cat.#		cat.#
5 μ L	N	26s	2"/51mm	2	75N	87900	ea.	24938
5 μ L	RN	26s	2"/51mm	2	75RN	87930	ea.	24617
10 μ L	N	26s	2"/51mm	2	701N	80300	ea.	20174
10 μ L	N	26s	2"/51mm	2	701N	80366	6-pk.	20175
10 μ L	RN	26s	2"/51mm	2	701RN	80330	ea.	24530
25 μ L	N	22s	2"/51mm	2	702N	80400	ea.	24531
10 μ L	N	26s	2"/51mm	5	701NPT5	80339	ea.	24967
*25 μ L	RN	22s	2"/51mm	2	702RN	80430	ea.	24532
50 μ L	N	22s	2"/51mm	2	705N	80500	ea.	24533
*50 μ L	RN	22s	2"/51mm	2	705RN	80530	ea.	24534
100 μ L	N	22s	2"/51mm	2	710N	80600	ea.	24535
*100 μ L	RN	22s	2"/51mm	2	710RN	80630	ea.	24536
250 μ L	N	22s	2"/51mm	2	725N	80700	ea.	24537
*250 μ L	RN	22s	2"/51mm	2	725RN	80730	ea.	24538
500 μ L	N	22	2"/51mm	2	750N	80800	ea.	24539
*500 μ L	RN	22	2"/51mm	2	750RN	80830	ea.	24540



SGE Standard Microliter Volume Syringe

SGE Syringes

Volume	Needle Term.	Needle Gauge	Needle Length	Point Style	SGE		qty.	Restek
					Model	cat.#		cat.#
5 μ L	F	26	50mm	2	5F**	001000	ea.	24700
*5 μ L	R	26	50mm	2	5R**	001050	ea.	24701
10 μ L	F	26	50mm	2	10F**	002000	ea.	24702
10 μ L	F	26	50mm	2	SK-10F**	002030	6-pk.	24715
*10 μ L	R	26	50mm	2	10R**	002050	ea.	24703
*10 μ L	R	26	50mm	2	SK-10R**	002080	6-pk.	24716
25 μ L	F	25	50mm	2	25F	003000	ea.	24704
*25 μ L	R	25	50mm	2	25R	003050	ea.	24705
50 μ L	F	25	50mm	2	50F	004000	ea.	24706
*50 μ L	R	25	50mm	2	50R	004050	ea.	24707
100 μ L	F	25	50mm	2	100F	005000	ea.	24708
*100 μ L	R	25	50mm	2	100R	005050	ea.	24709
250 μ L	F	25	50mm	2	250F	006000	ea.	24710
*250 μ L	R	25	50mm	2	250R	006050	ea.	24711
500 μ L	F	25	50mm	2	500F	007000	ea.	24712
*500 μ L	R	25	50mm	2	500R	007050	ea.	24713

*For replacement RN/R needles, see page 36.

**With plunger protection.



Teflon® Tip, Gas-Tight Syringes

- Suitable for gases or liquids for maximum inertness.
- High accuracy of dispensed volumes.
- Interchangeable barrels, plungers, and tips extend performance and increase cost-effectiveness.



Hamilton 1700/1000 Series Gas-Tight Syringe

Hamilton Syringes

Volume	Needle Term.	Needle Gauge	Needle Length	Point Style	Hamilton Model	Hamilton cat.#	qty.	Restek cat.#
10µL	N	26s	2"/51mm	2	1701	80000	ea.	24557
10µL	RN	26s	2"/51mm	2	1701	80030	ea.	24558
25µL	N	22s	2"/51mm	2	1702	80200	ea.	24559
25µL	RN	22s	2"/51mm	2	1702	80230	ea.	24560
50µL	N	22s	2"/51mm	2	1705	80900	ea.	24561
50µL	RN	22s	2"/51mm	2	1705	80930	ea.	24562
100µL	N	22s	2"/51mm	2	1710	81000	ea.	24563
100µL	RN	22s	2"/51mm	2	1710	81030	ea.	24564
250µL	N	22s	2"/51mm	2	1725	81100	ea.	24567
250µL	RN	22s	2"/51mm	2	1725	81130	ea.	24568
500µL	LTN	22	2"/51mm	2	1750	81217	ea.	24571
500µL	RN	22	2"/51mm	2	1750	81230	ea.	24572
1mL	LTN	22	2"/51mm	2	1001	81317	ea.	24575
1mL	RN	22	2"/51mm	2	1001	81330	ea.	24576
1mL	TLL	*	—	w/out slots	1001	81320	ea.	24578
2.5mL	TLL	*	—	w/out slots	1002	81420	ea.	24584
2.5mL	RN	22	2"/51mm	2	1002	81430	ea.	24582
2.5mL	N	22	2"/51mm	2	1002	81417	ea.	24581
5mL	TLL	*	—	w/out slots	1005	81520	ea.	20178
10mL	TLL	*	—	w/out slots	1010	81620	ea.	20179
25mL	TLL	*	—	w/out slots	1025	82520	ea.	24591
50mL	TLL	*	—	w/out slots	1050	85020	ea.	24717

Guide to Needle Termination Codes**Hamilton:**

(N) Cemented Needle
 (RN) Removable Needle
 (ASN) Autosampler
 Cemented Needle
 (ASRN) Autosampler
 Removable Needle
 (TLL) Teflon® Luer Lock
 (KH) Knurled Hub
 (LT) Luer Tip
 (LTN) Luer Tip Cemented
 Needle

SGE:

(F) Fixed Needle
 (R) Removable Needle
 (LL) Luer Lock
 (LT) Luer Tip



SGE Gas-Tight Syringe

SGE Syringes

Volume	Needle Term.	Needle Gauge	Needle Length	Point Style	SGE Model	SGE cat.#	qty.	Restek cat.#
10µL	F	26	50mm	2	10F-GT	002200	ea.	24725
10µL	R	26	50mm	2	10R-GT	002250	ea.	24726
25µL	F	25	50mm	2	25F-GT	003200	ea.	24727
25µL	R	25	50mm	2	25R-GT	003250	ea.	24728
50µL	F	25	50mm	2	50F-GT	004200	ea.	24729
50µL	R	25	50mm	2	50R-GT	004250	ea.	24730
100µL	F	25	50mm	2	100F-GT	005200	ea.	24734
100µL	R	25	50mm	2	100R-GT	005250	ea.	24735
100µL	LL	*	—	—	100F-LL-GT	005230	ea.	24737
250µL	F	25	50mm	2	250F-GT	006200	ea.	24738
250µL	R	25	50mm	2	250R-GT	006250	ea.	24739
250µL	LL	*	—	—	250F-LL-GT	006230	ea.	24741
500µL	F	25	50mm	2	500F-GT	007200	ea.	24742
500µL	R	25	50mm	2	500R-GT	007250	ea.	24743
1mL	R	23	50mm	2	1MR-GT	008100	ea.	24750
1mL	LL	*	—	—	1MDF-LL-GT	008025	ea.	24752
2.5mL	LL	*	—	—	2.5MDF-LL-GT	008425	ea.	24755
5mL	LL	*	—	—	5MDR-LL-GT	008760	ea.	24757
10mL	LL	*	—	—	10MDR-LL-GT	008960	ea.	24759
25mL	LL	*	—	—	25MDR-LL-GT	009462	ea.	24760
50mL	LL	*	—	—	50MR-LL-GT	009660	ea.	24761
100mL	LL	*	—	—	100MR-LL-GT	009760	ea.	24762

*Needles sold separately. See page 36.

Gas-Tight Syringe Replacement Needles

Teflon® Tip, Gas-Tight Syringe Replacement Needles for Removable Needle Syringes

Materials: stainless steel needle, nickel plated brass hub

Needles for Hamilton Syringes

Syringe Volume	Needle Gauge	Needle Length	Point Style	Hamilton cat.#	qty.	Restek cat.#
5–100µL	26s	2"	2	7758-02	6-pk.	24939
5–100µL	22s	2"	2	7758-03	6-pk.	24940
250µL–10mL	22	2"	2	7779-01	6-pk.	24942
250µL–10mL	26s	2"	2	7779-02	6-pk.	24943
250µL–10mL	22s	2"	2	7779-03	6-pk.	24944

Needles for SGE Syringes

Syringe Volume	Needle Gauge	Needle Length	Point Style	SGE cat.#	qty.	Restek cat.#
5µL	26	50mm	2	036110	5-pk.	24802
10µL	23	50mm	2	037111	5-pk.	24804
10µL	26	50mm	2	037110	5-pk.	24803
25–500µL	23	50mm	2	038111	5-pk.	24806
25–500µL	25	50mm	2	038110	5-pk.	24805
1–2.5mL	23	50mm	2	039110	5-pk.	24807

Gas-Tight Syringe Replacement Needles for Luer-Lock Syringes

Needles for Hamilton Syringes

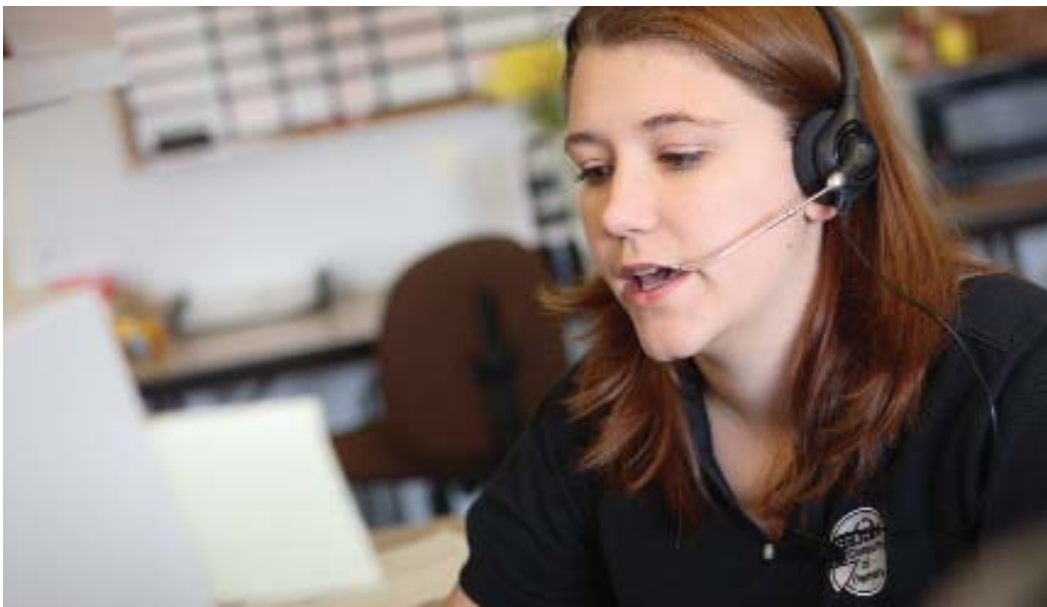
Hub Material	Needle Gauge	Needle Length	Point Style	Hamilton cat.#	qty.	Restek cat.#
metal	26s	2"/51mm	2	90053	6-pk.	20133
metal	25s	1.97"	3	90049*	6-pk.	24605
metal	22s	2"/51mm	2	90051	6-pk.	24606
Kel-F® (Teflon® tip)	26s	2"/51mm	2	90153	6-pk.	24607
Kel-F® (Teflon® tip)	25s	1.97"	3	90149*	6-pk.	24608
Kel-F® (Teflon® tip)	22s	2"/51mm	2	90151	6-pk.	24609

Needles for SGE Syringes

Hub Material	Needle Gauge	Needle Length	Point Style	SGE cat.#	qty.	Restek cat.#
metal	23	50mm	2	039802	5-pk.	24763
metal	22	2"/51mm	3	039895**	2-pk.	24765
metal	18	50mm	2	039842	5-pk.	24764

*For Waters U6K injection valve.

**For Rheodyne®/Valco® valves.



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