

Genuine Restek Replacement Parts for PerkinElmer GCs



HROMalytic **Chromatography**
Products '08
Australian Distributors **TECH**nology
www.chromtech.net.au E-mail : info@chromtech.net.au Tel : +61 3 9762 2034 Fax : +61 3 9761 1169

RESTEK

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 PerkinElmer 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.

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Australian Distributors ECHnology
 www.chromtech.net.au E-mail : info@chromtech.net.au Tel : +61 3 9762 2034 Fax : +61 3 9761 1169



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).

tech tip

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

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

| 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™ | |
|--------|---------------|------------|----------------------|------------|----------------------------|------------|
| | | addl. cost | | addl. cost | | addl. cost |
| each | -214.1 | | -213.1 | | -216.1 | |
| 5-pk. | -214.5 | | -213.5 | | -216.5 | |
| 25-pk. | -214.25 | | -213.25 | | -216.25 | |

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™ | |
|--------|------------------------|------------|------------------------------------------------|------------|-------------------------------------|------------|
| | | addl. cost | | addl. cost | | addl. cost |
| each | -210.1 | | -211.1 | | -229.1 | |
| 5-pk. | -210.5 | | -211.5 | | -229.5 | |
| 25-pk. | -210.25 | | -211.25 | | -229.25 | |

← 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)

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Australian Distributors ECHnology
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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 |

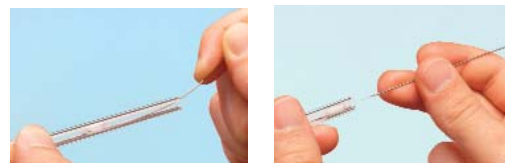
Base-Deactivated Wool

Ideal for amines and other basic compounds.

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

Mini Wool Puller/Inserter

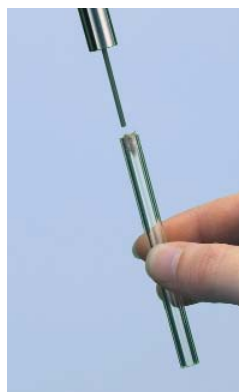
Insert and remove wool plugs easily. Order a spare pack so you'll always have one available.



| 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 |

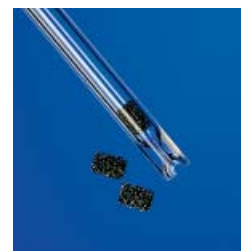
†CarboFrit™ inserts require a neck greater than 2mm.



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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.





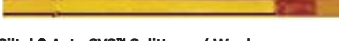


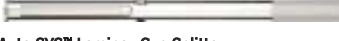

Inlet Liners











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www.chromtech.net.au Tel: +61 3 9762 2034 Fax: +61 3 9761 1169
 info@chromtech.net.au

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

| Split Liners for PerkinElmer GCs | Benefits/Uses: | ID*/OD & Length (mm) | Similar to PE part # | ea. | cat.# 5-pk. | 25-pk. |
|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------|----------------------|-------------|-------------|--------------|
|  Baffle Splitter | universal, for most common analyses | 3.5 ID 5.0 OD x 100 | N6502008 | 20736 | 20737 | — |
|  Cup Splitter | high & low MW compounds | 3.5 ID 5.0 OD x 100 | — | 20739 | 20740 | — |
|  Cyclosplitter® | dirty samples, many injections before cleaning required | 3.5 ID 5.0 OD x 100 | — | 20745 | 20746 | — |
|  Auto SYS™ Splitter w/ Wool | universal for most common analyses | 4.0 ID 6.2 OD x 92.1 | N6502009 | 20832 | 20833 | 20834 |
|  Siltek® Auto SYS™ Splitter w/ Wool | universal for most common analyses | 4.0 ID 6.2 OD x 92.1 | N6502010 | 20832-213.1 | 20833-213.5 | 20834-213.25 |
|  Auto SYS™ Cup Splitter | high & low MW compounds | 4.0 ID 6.2 OD x 92.1 | N6502011 | 20835 | 20836 | — |
|  Auto SYS™ Cyclosplitter® | dirty samples, many injections before cleaning required | 4.0 ID 6.2 OD x 92.1 | N6502012 | 20910 | 20911 | — |
|  Auto SYS™ Laminar Cup Splitter | high MW compounds | 4.0 ID 6.2 OD x 92.1 | — | 20827 | 20828 | — |
|  Auto SYS™ Split Precision™ Liner w/ Wool | dirty samples, trace samples | 4.0 ID 6.2 OD x 92.1 | N6121020 | 21026 | 21027 | — |

| Splitless Liners for PerkinElmer GCs | Benefits/Uses: | ID*/OD & Length (mm) | Similar to PE part # | ea. | cat.# 5-pk. | 25-pk. |
|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------|----------------------|-------------|-------------|--------------|
|  Splitless (2mm ID) | trace samples | 2.0 ID 5.0 OD x 100 | N6502007 | 20730 | 20731 | 20732 |
|  Auto SYS™ Splitless | headspace & purge & trap | 1.0 ID 6.2 OD x 92.1 | N6502006 | 21272 | 21273 | 21274 |
|  Auto SYS™ Splitless w/ Wool (2mm ID) | trace samples | 2.0 ID 6.2 OD x 92.1 | N6121021 | 20829 | 20830 | 20831 |
|  Siltek® Auto SYS™ Splitless w/ Wool (2mm ID) | trace samples | 2.0 ID 6.2 OD x 92.1 | N6502004 | 20829-213.1 | 20830-213.5 | 20831-213.25 |
|  Auto SYS™ Double Gooseneck | trace, active samples up to 4µL | 4.0 ID 6.2 OD x 92.1 | N6502003 | 20853 | 20854 | — |
|  Auto SYS™ Cyclo Double Gooseneck | trace, dirty, active samples, up to 4µL | 4.0 ID 6.2 OD x 92.1 | N6502005 | 20899 | 20900 | — |

| PSS Liners for PerkinElmer GCs | Benefits/Uses: | ID*/OD & Length (mm) | Similar to PE part # | ea. | cat.# 5-pk. | 25-pk. |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------------|----------------------|-------|-------------|--------|
|  PSS Split/Splitless (1mm ID) | trace samples | 1.0 ID 4.0 OD x 86.2 | N6121006 | 20738 | 20741 | — |
|  Auto SYS™ XL PSS Split/Splitless w/ Wool | most common analyses | 2.0 ID 4.0 OD x 86.2 | N6121004 | 21717 | 21718 | — |

*Nominal ID at syringe needle expulsion point.



ordering note



For descriptions of liner deactivations, packings, and tools, see pages 3-5.



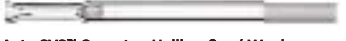

All liners are
100% deactivated





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

COLUMN INSTALLS THIS END

| Zero Dilution Liners for PerkinElmer Auto SYS™ and Clarus GCs | | Benefits/Uses: | ID*/OD & Length (mm) | Similar to PE part # | ea. | cat.# 5-pk. | 25-pk. |
|-----------------------------------------------------------------------------------|--------------------|-----------------------|-------------------------|-------------------------|-------|----------------|--------|
|  | headspace analysis | 1.0 ID 2.0 OD x 73 | N1011446 | 22990 | 22991 | new! | |
| Zero Dilution Inner Liner | | | | | | | |
|  | headspace analysis | 2.5 ID 6.2 OD x 90 | N1011445 | 22992 | 22993 | new! | |
| Zero Dilution Outer Liner | | | | | | | |

| PTV Liners for PerkinElmer GCs | | Benefits/Uses: | ID*/OD & Length (mm) | Similar to PE part # | ea. | cat.# 5-pk. | 25-pk. |
|-----------------------------------------------------------------------------------|-------------------------------------------------------|-----------------------|-------------------------|-------------------------|-------|----------------|--------|
|  | high linearity for 0.25, 0.32, & 0.53mm ID columns | 1.0 ID 2.0 OD x 88 | — | 20733 | 20734 | 20735 | |
| PTV Press-Tight® | | | | | | | |
|  | high linearity | 1.0 ID 2.0 OD x 88 | — | 20742 | 20743 | 20744 | |
| PTV Injector | | | | | | | |

| DI Liners for PerkinElmer GCs (0.32/0.53mm ID) | | Benefits/Uses: | ID*/OD & Length (mm) | Similar to PE part# | ea. | cat.# 5-pk. | 25-pk. |
|-----------------------------------------------------------------------------------|------------------------------------------------------------|-------------------------|-------------------------|------------------------|-------|----------------|--------|
|  | trace, active samples, high recovery & linearity | 3.5 ID 5.0 OD x 100 | N6502018 | 20855 | 20856 | — | |
| Uniliner® | | | | | | | |
|  | trace, dirty, active samples, high linearity | 3.5 ID 5.0 OD x 100 | N6502019 | 20857 | 20858 | — | |
| Cyclo-Uniliner® | | | | | | | |
|  | trace, dirty, active samples, high recovery & linearity | 4.0 ID 6.2 OD x 92.1 | N6502016 | 20837 | 20838 | — | |
| Auto SYS™ Open-top Uniliner® w/ Wool | | | | | | | |
|  | trace, dirty, high MW active samples, high linearity | 4.0 ID 6.2 OD x 92.1 | N6502017 | 20839 | 20840 | — | |
| Auto SYS™ Cyclo-Uniliner® | | | | | | | |

| DI Liners for PerkinElmer GCs (For 0.32/0.53mm ID Columns) | | Benefits/Uses | ID*/OD & Length (mm) | Similar to PE part # | cat.# ea. | cat.# 5-pk. |
|-------------------------------------------------------------------------------------|-----------------------------------------------------|-------------------------|-------------------------|-------------------------|--------------|----------------|
|  | trace, active samples, high recovery & linearity | 4.0 ID 6.2 OD x 92.1 | N6121022 | 20819 | 20822 | |
| Auto SYS™ Drilled Uniliner® (hole on top) | | | | | | |
|  | trace, active samples, high recovery & linearity | 4.0 ID 6.2 OD x 92.1 | N6502013 | 21293 | 21294 | |
| Auto SYS™ Drilled Uniliner® (hole on bottom) | | | | | | |
|  | trace, active samples, high recovery & linearity | 4.0 ID 6.2 OD x 92.1 | N6502014 | 21295 | 21296 | |
| Auto SYS™ Gooseneck Drilled Uniliner® (hole on top) | | | | | | |
|  | trace, active samples, high recovery & linearity | 4.0 ID 6.2 OD x 92.1 | N6502015 | 21297 | 21298 | |
| Auto SYS™ Gooseneck Drilled Uniliner® (hole on bottom) | | | | | | |

*Nominal ID at syringe needle expulsion point.

tech tip

DI Liners for PerkinElmer 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.

Graphite O-Rings for PerkinElmer Auto SYS™ XL PSS

| Description | Max. temp. | Similar to PE part # | qty. | cat.# |
|---------------------------------------------------|------------|----------------------|--------|-------|
| Graphite O-Rings for PerkinElmer Auto SYS™ XL PSS | 450°C | N610-1751 | 10-pk. | 21475 |
| Graphite O-Rings for PerkinElmer Auto SYS™ XL PSS | 450°C | N610-1751 | 25-pk. | 21476 |



Viton® O-Rings for PerkinElmer PSS

| Description | Max. temp. | Similar to PE part # | qty. | cat.# |
|------------------------------------|------------|----------------------|--------|-------|
| Viton® O-Rings for PerkinElmer PSS | 250°C | N6101747 | 10-pk. | 20366 |



Silicone O-Rings for PerkinElmer Auto SYS™ GCs

| Description | Max. temp. | Similar to PE part # | qty. | cat.# |
|------------------------------------------------|------------|----------------------|--------|-------|
| Silicone O-Rings for PerkinElmer Auto SYS™ GCs | 250°C | N6101374 | 10-pk. | 20262 |



11mm Septa for PerkinElmer GCs

- Precision molded, for consistent, accurate fit.



| Thermolite® Septa (useable to 340°C inlet temp.) | |
|-----------------------------------------------------|-------|
| qty. | cat.# |
| 25-pk. | 27141 |
| 50-pk. | 27142 |
| 100-pk. | 27143 |

| IceBlue™ Septa (useable to 250°C inlet temp.) | |
|--------------------------------------------------|-------|
| qty. | cat.# |
| 50-pk. | 27162 |
| 100-pk. | 27163 |

| BTO® Septa (useable to 400°C inlet temp.) | |
|----------------------------------------------|-------|
| qty. | cat.# |
| 50-pk. | 27110 |
| 100-pk. | 27111 |

HANDY
septum size chart

| PE Instrument | Septum Diameter (mm) |
|---------------|----------------------|
| Sigma series | 11 |
| 900,990 | 11 |
| 8000 series | 11 |
| Auto SYS™ | 11 |
| Auto SYS™ XL | 11 |

Septum Cap for PerkinElmer Auto SYS™ XL

- Made of clear anodized aluminum and high-quality stainless steel.
- Meets or exceeds OEM performance.



| Description | Similar to PE part # | qty. | cat.# |
|-----------------------------------------|----------------------|------|-------|
| Septum Cap for PerkinElmer Auto SYS™ XL | N6100153 | ea. | 22322 |

Injector Adaptor for PerkinElmer Auto SYS™ XL

- Made of high-quality stainless steel.
- Meets or exceeds OEM performance.
- Siltek® treated version available for increased inertness.



| Description | Similar to PE part # | qty. | cat.# |
|---------------------------------------------------------------|----------------------|------|-------|
| A) For use with PE style capillary nuts | | | |
| Injector Adaptor for PerkinElmer Auto SYS™ XL | N6100157 | ea. | 22318 |
| Siltek® Treated Injector Adaptor for PerkinElmer Auto SYS™ XL | — | ea. | 22320 |
| B) For use with 1/16" compression style nuts | | | |
| Injector Adaptor for PerkinElmer Auto SYS™ XL | — | ea. | 22319 |
| Siltek® Treated Injector Adaptor for PerkinElmer Auto SYS™ XL | — | ea. | 22321 |

FID Capillary Column Adaptor for PerkinElmer Auto SYS™ XL

- Made of high-quality stainless steel.
- Meets or exceeds OEM performance.



| Description | Similar to PE part # | qty. | cat.# |
|-----------------------------------------------------------|----------------------|------|-------|
| A) For use with PE style capillary nuts | | | |
| FID Capillary Column Adaptor for PerkinElmer Auto SYS™ XL | N6120020 | ea. | 22608 |
| B) For use with 1/16" compression style nuts | | | |
| FID Capillary Column Adaptor for PerkinElmer Auto SYS™ XL | — | ea. | 22609 |

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FID Replacement Parts for PerkinElmer Auto SYS™ XL and Clarus 500

- Made of high-quality stainless steel.
- Meet or exceed OEM performance.



| Description | Similar to PE part # | qty. | cat.# |
|----------------------------------------------------------------------------------|----------------------|------|-------|
| FID Jet for PerkinElmer Auto SYS™ XL and Clarus 500 | N6100361 | ea. | 23038 |
| | N6103167 | | |
| Auto-Ignite FID Replacement Part Kit for PerkinElmer Auto SYS™ XL and Clarus 500 | N6103175 | kit | 23061 |
| | N6101085 | | |
| | N6001204 | | |
| | 09912223 | | |
| Nozzle Insulator for PerkinElmer Auto SYS™ XL and Clarus 500 | N6101085 | ea. | 23062 |
| FID Body for PerkinElmer Auto SYS™ XL and Clarus 500 | N6100364 | ea. | 23063 |

MLE Capillary Tool Kit for PerkinElmer GCs

Includes:

- 1/8", 3/16", and 1/4" nylon brushes
- 1/4", 3/8", and 3/16" stainless steel wire tube brushes
- stainless steel surface brush
- 6 stainless steel jet reamers (0.25–0.65mm OD)
- 1/4" x 5/16" open end wrench
- 3/8" x 7/16" open end wrench
- 7/16" x 1/2" open end wrench
- 1/2" x 9/16" open end wrench
- rubber-tipped slide-lock tweezers
- scoring wafers with handles
- inlet liner removal tool
- septum puller
- mini wool puller/inserter 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 PerkinElmer GCs | kit | 22185 |

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



Ceramic Scoring Wafers

- Four straight scoring edges for cutting fused silica tubing 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 | qty. | cat.# |
|------------------------|-------|-------|
| Ceramic Scoring Wafers | 5-pk. | 20116 |



Sapphire Scribe

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



One quick stroke...



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

| Description | qty. | cat.# |
|-----------------|------|-------|
| Sapphire Scribe | ea. | 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 | qty. | cat.# |
|---------------------------------------------------------|------|-------|
| Shortix® Capillary GC Column Cutter | ea. | 23026 |
| Maintenance Kit for Shortix® Capillary GC Column Cutter | kit | 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 | qty. | cat.# |
|-----------------------|--------|-------|
| Capillary Column Caps | 10-pk. | 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 |

Slide-Lock Tweezers and 15cm Compact Steel Ruler

- “Lock” capillary columns to the correct insertion distance recommended by the instrument manufacturer during installation.
- Useful for many laboratory tasks.



| Description | qty. | cat.# |
|--------------------------------------------------|------|-------|
| Slide-Lock Tweezers and 15cm Compact Steel Ruler | set | 20101 |

High-Temperature String

- Withstands temperatures to 400°C.
- Use to restring capillary columns, attach column connectors to column cages, or hold a column in the GC oven.



| Description | qty. | cat.# |
|-------------------------|------|-------|
| High-Temperature String | 10m | 20109 |
| High-Temperature String | 450m | 20618 |

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 |

Stainless Steel Tube Brushes/Surface Brush

Unlike brass brushes that can leave a metal residue, these stainless steel tube brushes ($\frac{3}{8}$ -, $\frac{3}{16}$ -, and $\frac{1}{4}$ -inch) work well for cleaning dirty collectors, injector ports, and detector ports. The surface brush can be used to remove residue that builds up on metal detector jets and electronic contacts.



| Description | qty. | cat.# |
|--------------------------------------------|-------------|-------|
| Stainless Steel Tube Brushes/Surface Brush | 4-piece set | 20112 |

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 |

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!

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

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

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 | Vespe ^l ®/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. | Vespe ^l ®/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 Vespe^l® 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 |



tech tip

Choosing the Right Ferrule

Although graphite and Vespe^l®/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.

Vespe^l®/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 Vespe^l®/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.

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Vu2 Union™ Column Connectors



Patent pending.

Secure, reliable column-to-column connections!

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.

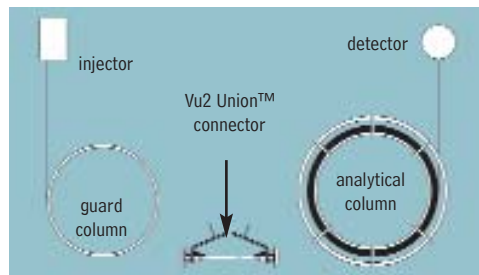
How does a Vu2 Union™ connector work?

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.

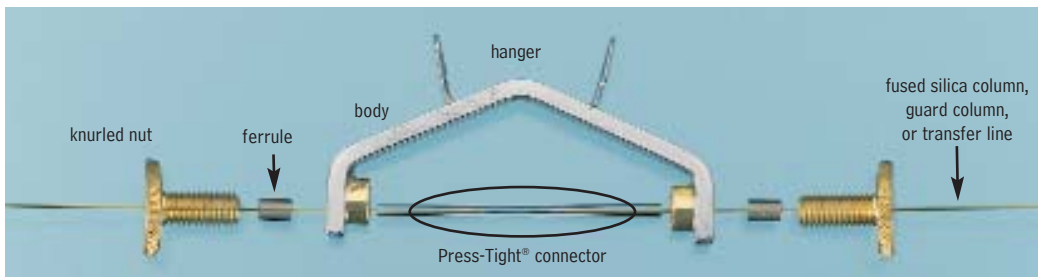
Who will benefit from using Vu2 Union™ connectors?

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.

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



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



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

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 |

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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.

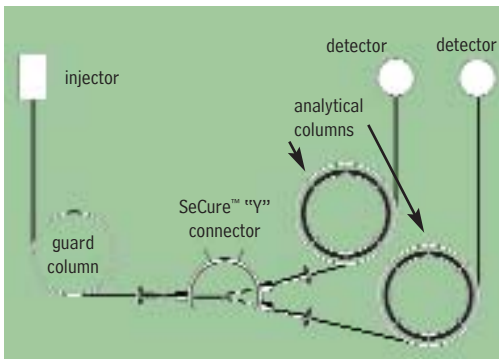
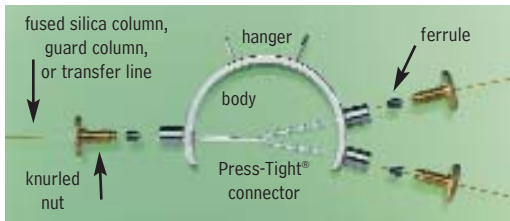
Combine the simplicity of a "Y" Press-Tight® connector with the strength of a metal union. The ferrules and knurled nuts hold the fused silica tubing in place, which prevents the tubing from unexpectedly disconnecting, even at temperatures as high as 400°C.

The SeCure™ "Y" Connector's open design allows visual confirmation of the seal.

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!

a plus 1 story

"Restek is a great corp. that keeps us operating on a daily basis with your GC supplies. We really love the new SeCure™ "Y" Connector. It has worked wonders for us."

Eric A. Lorge, Project Manager, Major Equipment Manufacturer, Environmental Lab

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

- 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 |



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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 Valco 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 Valco 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 Valco 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 (Valco 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 |



HROMalytic Chromatography Products '08
Australian Distributors ECH nology



www.chromtech.net.au E-mail : info@chromtech.net.au Tel : +61 3 9762 2034 Fax : +61 3 9761 1169



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)

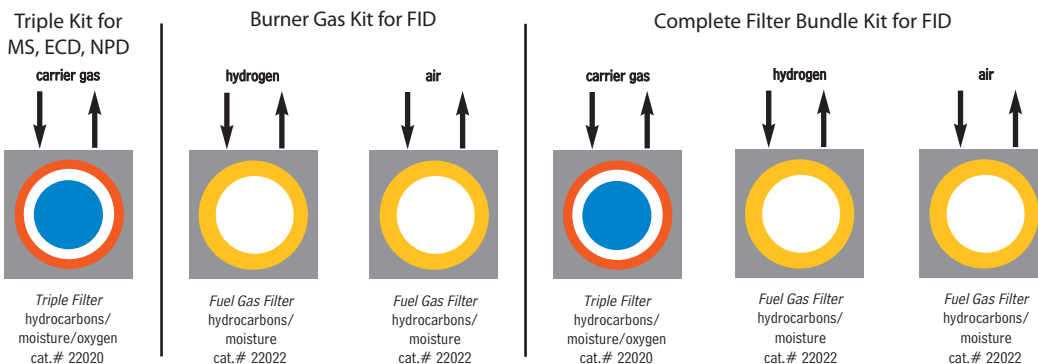
The Triple Filter cartridge (cat.# 22020) is ideal for purifying carrier gas. This trap contains oxygen, moisture, and hydrocarbon scrubbers in one cartridge. The purity of your carrier gas after flowing through the Triple Filter is better than six-9s (99.9999% pure), which is ideal for sensitive mass 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.

Figure 1 Filter cartridges can be configured for different applications.



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.

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 ³ | >2 |
| Fuel Gas ¹ cat.# 22022 | >99.9999 | 11 bar 159psi/ 7L/min. | Inert carrier gas Air Hydrogen | Yellow to clear | 3.5 | — | 24 ³ | >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 ³ | >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

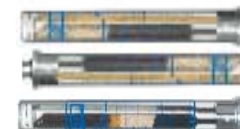
| Description | qty. | cat.# |
|-----------------------------------------------------------------------|------|-------|
| Replacement Triple Filter (removes oxygen, moisture and hydrocarbons) | ea. | 22020 |
| Replacement Fuel Gas Filter (removes moisture and hydrocarbons) | ea. | 22022 |



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 |



Super-Clean™ Gas Filter Systems



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 |



www.chromtech.net.au E-mail : info@chromtech.net.au Tel : +61 3 9762 2034 Fax : +61 3 9761 1169

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 |
| 1/4" 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) | Pressure Drop from 120psi (827 kPa) | |
| Diameter: | 1.5" (3.8cm) | inlet at a flow of 0-500mL/min.: | <0.20psi (2.1kPa) |
| Maximum Inlet Pressure: | 1000psi (6895 kPa) | Compression End Fittings: | 1/8" or 1/4", stainless steel |
| Maximum Recommended Flow: | 500mL/min. | Shipping Weight: | 3.04 lb. (1300 g) |

it's a fact

The nitrogen module is excellent for LC/MS systems.

Gas-Specific

Purifier Module

| | Compression Tube Fittings | | | |
|---------------------------|---------------------------|-------|----------|-------|
| | 1/4-inch | | 1/8-inch | |
| | qty. | 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.

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.



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

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

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.



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

GC/MS Compatible

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

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.



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

| 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.



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

| 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.



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

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

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).

| 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) |



Produce zero air and pure hydrogen from one unit!

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.

| 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 |

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 |

Ultra-High-Purity Chrome-Plated Brass Line Regulator

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

Inlet connections: 1/4" FPT
 Outlet assembly: 1/4" FPT port

| Fitting | Outlet Gauge | Outlet Pressure | qty. | cat.# |
|------------------------|--------------------|-----------------|------|-------|
| 1/4" female NPT ports* | 30" - 0 to 100psig | 0-50psig | ea. | 21666 |
| 1/4" female NPT ports* | 30" - 0 to 200psig | 0-100psig | ea. | 22452 |

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

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.



| 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 | 1/16" OD | 21500 | 21501 | 21502 |
| 0.02" ID | 1/16" OD | 21503 | 21504 | 21505 |
| 0.03" ID | 1/16" OD | 21506 | 21507 | 21508 |
| 0.04" ID | 1/16" 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.
- Pre-cleaned 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 |

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 |



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.

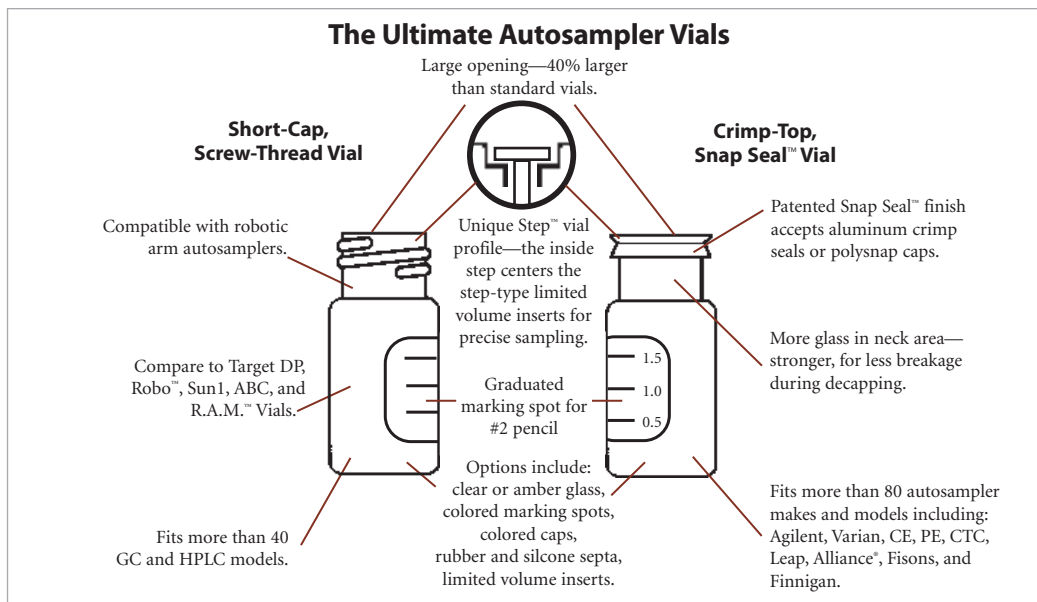


| Description | qty. | cat.# |
|-----------------------------|------|-------|
| 1/16" Tubing Cutting Pliers | ea. | 20193 |



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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

| PerkinElmer Instrument Model # | 11mm Crimp-Top | 9mm Short-Cap, Screw-Thread | 8mm Crimp-Top 8 x 30mm | Headspace | 8mm Screw-Thread |
|--------------------------------------------------------------|----------------|-----------------------------|------------------------|-----------|------------------|
| AI-1 | X | X | X | | |
| ISS 100, LC 600 42 vial tray | X | X | | | |
| ISS 200 | X | X | | X | |
| Integral 4000 | X | | | X | |
| Autosystem GC 420/B, 4900 | X | | | X | X |
| F40, F45, HS 6, HS 40 | | | | X | |
| LC 600 (60), AS100/B, 300, 8300, AS2000, LC 30, 2000, B 2000 | | | X | | |



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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 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 # |
|--------------|----------------------------------------------------------------------------------------|
| PerkinElmer | Autosystem GC, AI-1, Integral 4000, ISS 100, ISS 200, LC 600 42 vial tray, 420/B, 4900 |



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9mm Screw-Thread Vials / 8mm Crimp-Top Vials

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.



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

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 | — |

instrument reference

For 9mm Short-Cap, Screw-Thread Vials

| Manufacturer | Instrument/Model # |
|--------------|---------------------------------------------|
| PerkinElmer | AI-1, ISS 100, ISS 200, LC 600 42 vial tray |

8mm Crimp-Top Vials, 0.8mL, 8 x 30mm

0.8mL Crimp-Top Vials—8 x 30mm, 8mm Crimp

| Description | 100-pk. | 1000-pk. |
|-------------------------------|---------|----------|
| 0.8mL Clear Flat Bottom Vials | 24695 | 24696 |

8mm Aluminum Seals w/Septa

| Description | 100-pk. | 1000-pk. |
|------------------------------------------------|---------|----------|
| Silver Seals w/Clear PTFE/Natural Rubber Septa | 21757 | 21758 |

8mm Crimper and Decapper

| Description | qty. | cat.# |
|--------------|------|-------|
| 8mm Crimper | ea. | 21735 |
| 8mm Decapper | ea. | 21736 |

instrument reference

For 8mm Crimp-Top Vials, 8 x 30mm

| Manufacturer | Instrument/Model # |
|--------------|--------------------------------------------------------------------|
| PerkinElmer | LC 600 (60), AS100/B, 300, 8300, AI-1, AS2000, LC 30, 2000, B 2000 |



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 |

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 |

instrument **reference**

For 8mm Screw-Thread Vials

| Manufacturer | Instrument/Model # |
|--------------|----------------------------|
| PerkinElmer | Autosystem GC, 420/B, 4900 |



8mm (2.0mL)
Screw-Thread Vial

Headspace Vials



Headspace Autosampler Vials*

| Description | 100-pk. | 1000-pk. |
|------------------------------------|---------|----------|
| a) 6mL Clear Vial | 21166 | 21167 |
| 10mL Clear Vial, Flat Bottom | 24683 | 24684 |
| b) 10mL Clear Vial, Rounded Bottom | 21164 | 21165 |
| 20mL Clear Vial, Flat Bottom | 24685 | 24686 |
| c) 20mL Clear Vial, Rounded Bottom | 21162 | 21163 |
| 27mL Clear Vial | 21160 | 21161 |

*a) - c) designated in instrument reference chart below.

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.

instrument reference

For Headspace Vials

| Manufacturer | Instrument/Model # |
|----------------|-----------------------------------------------------|
| a) PerkinElmer | ISS 200 |
| b) PerkinElmer | Autosystem GC, F40, F45, HS 6, Integral 4000, HS 40 |
| c) PerkinElmer | Autosystem GC, F40, F45, HS 6, Integral 4000, HS 40 |

Aluminum Seal Crimpers and Decappers

Safer than removing caps with pliers, knife or screwdriver blade!

The crimper is adjustable for optimized sealing performance and is comfortable enough for prolonged use. If you need to save, transfer, or dispose of your samples, our decapper allows you to remove a crimp-top cap safely and easily. Far safer than removing caps with pliers, knife or screwdriver blades, etc. If you aren't currently using a seal decapper, we recommend you order one today!



Decapper



Crimper

| Description | qty. | cat.# |
|---------------|------|-------|
| 8mm Crimper | ea. | 21735 |
| 8mm Decapper | ea. | 21736 |
| 11mm Crimper | ea. | 21170 |
| 11mm Decapper | ea. | 21171 |
| 13mm Crimper | ea. | 21739 |
| 13mm Decapper | ea. | 21740 |
| 20mm Crimper | ea. | 21737 |
| 20mm Decapper | ea. | 21738 |



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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 |



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RESTEK

• www.restek.com

Syringe Overview

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.

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.

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 disassembled.



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 PerkinElmer Autosystem™ and Clarus 500 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 5µL Autosampler Syringe

Hamilton Syringes

| Volume | Needle Term. | Needle Gauge | Needle Length | Point Style | Hamilton | | | Restek |
|--------|--------------|--------------|---------------|-------------|----------|-------|------|--------|
| | | | | | Model | cat.# | qty. | cat.# |
| 5µL | ASN | 23 | 2.756" | 3 | 75ASN/PE | 88035 | ea. | 24953 |
| 5µL | ASN | 26 | 2.756" | 3 | 75ASN/PE | 88040 | ea. | 24952 |



SGE 5µL Autosampler Syringe

SGE Syringes

| Volume | Needle Term. | Needle Gauge | Needle Length | Point Style | SGE | | | Restek |
|--------|--------------|--------------|---------------|-------------|----------------|--------|------|--------|
| | | | | | Model | cat.# | qty. | cat.# |
| 0.5µL | R | 23 | 70mm | Cone | 0.5BR-PE-0.63 | 000478 | ea. | 24811 |
| 0.5µL | R | 26 | 70mm | Cone | 0.5BR-PE-0.47 | 000475 | ea. | 24810 |
| 5µL | F | 23 | 70mm | Cone | 5F-PE-0.63 | 001954 | ea. | 24813 |
| 5µL | F | 23 | 70mm | Cone | 5F-PE-GT-0.63* | 001957 | ea. | 24815 |
| 5µL | F | 26 | 70mm | Cone | 5F-PE-0.47 | 001953 | ea. | 24812 |
| 5µL | F | 26 | 70mm | Cone | 5F-PE-GT-0.47* | 001955 | ea. | 24814 |
| 50µL | F | 23 | 70mm | Cone | 50F-PE-0.63 | 004670 | ea. | 24816 |

*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

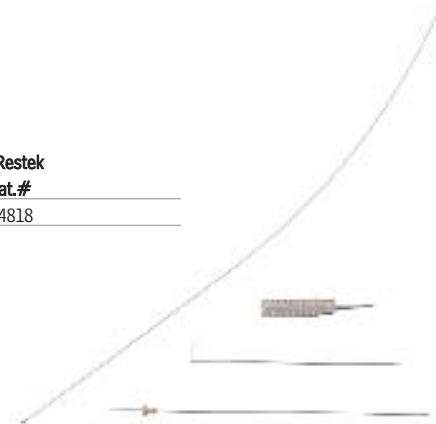
SGE:

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

Replacement Needles for PerkinElmer Autosampler Syringes

Needle and Plunger Kits

| Syringe Volume | Needle Gauge | Needle Length | Point Style | SGE cat.# | qty. | Restek cat.# |
|----------------|--------------|---------------|-------------|-----------|------|--------------|
| 0.5µL | 23 | 70mm | Cone | 033765 | kit | 24818 |



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Australian Distributors ECH nology

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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 cat.# |
|--------------|--------------|--------------|---------------|-------------|----------|-------|-------|--------------|
| | | | | | Model | 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 cat.# |
|--------------|--------------|--------------|---------------|-------------|----------|--------|-------|--------------|
| | | | | | Model | 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 | | Restek |
|--------|--------------|--------------|---------------|-------------|----------|-------|-----------|
| | | | | | Model | 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 | | Restek |
|--------|--------------|--------------|---------------|-------------|--------------|--------|-----------|
| | | | | | Model | 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

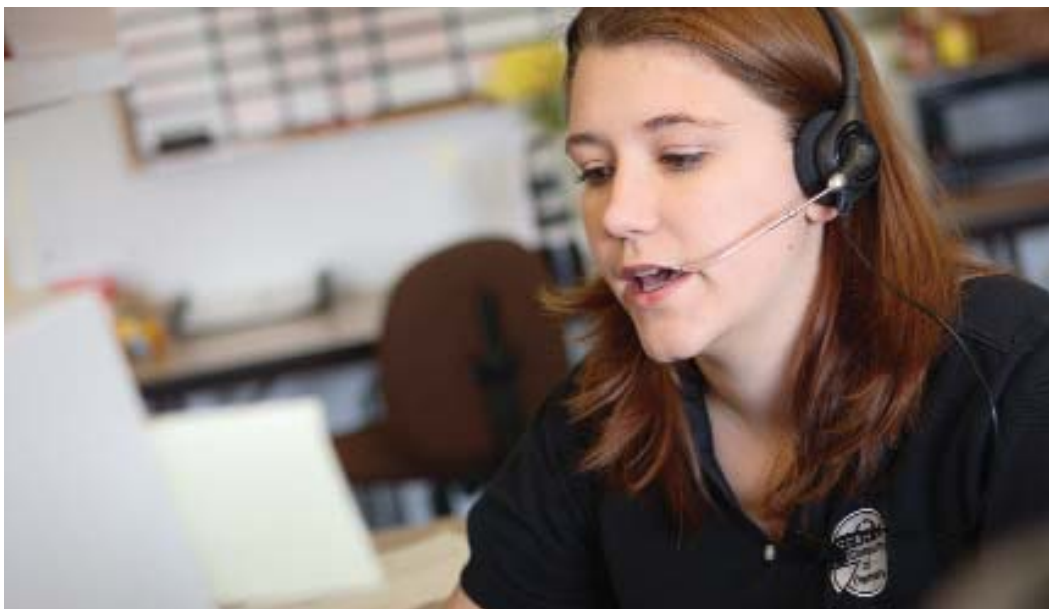
| Hub Material | Needle Gauge | Needle Length | Point Style | Hamilton cat.# | qty. | Restek cat.# |
|----------------------|--------------|---------------|-------------|----------------|-------|--------------|
| metal | 26s | 2"/51mm | 2 | 90053 | 6-pk. | 20133 |
| metal | 25s | 1.97" | 3 | 90049* | 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 |

*For Waters U6K injection valve.

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 |

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